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INTERNATIONAL EDUCATION SERIES

THE
INTELLECTUAL AND MORAL DEVELOPMENT
OF THE CHILD

PART I

CONTAINING THE CHAPTERS ON PERCEPTION, EMOTION,
MEMORY, IMAGINATION, AND CONSCIOUSNESS

BY

GABRIEL COMPAYRÉ

RECTEUR OF THE ACADEMY OF POITIERS

TRANSLATED FROM THE FRENCH

By MARY E. WILSON

B. L. SMITH COLLEGE

MEMBER OF THE GRADUATE SEMINARY IN CHILD STUDY,
UNIVERSITY OF CALIFORNIA

NEW YORK
D. APPLETON AND COMPANY

1900

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ELECTROTYPED AND PRINTED
AT THE APPLETON PRESS, U. S. A.

EDITOR'S PREFACE.

50.01.51m.
THE present volume contains the first half of the translation of the work of Professor Gabriel Compayré, entitled *L'Évolution Intellectuelle et Morale de l'Enfant.*" The object of the work is to bring together in a systematic pedagogical form what is known regarding the development of infant children so far as the facts have any bearing upon early education.

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As a field of investigation and original research, physiological psychology, anthropology, or the study of man as an object of natural history, and, quite recently, the specialization of inquiry, limiting it to the still narrower field which includes the child in his stages of infancy and boyhood or girlhood, have attracted an increasing number of students.

A few years ago the department of folklore began to be studied as one of the minute subdivisions of anthropology. This led to an investigation of children's games, and much light was thrown upon the mode in which the childish mind mimics for itself the manners and ceremonies as well as the serious occupations of the grown-up people about it. It is even found that

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these games in some cases (for instance, in the counting-out rhymes) point back to the dreadful rites of human sacrifice, the slaughtering of prisoners by the Druids and others who offered them to their gods. The selection of these victims devoted to sacrifice by counting-out rhymes borrowed from the poems of *The Edda* * is long since faded out of history, but there is a reflection of it come down to us in the plays of the children. Perhaps, too, all of these personal experiences of the race are impressed upon the brain and nerve cells, and a sort of physiological memory still exists in each person, and on occasions arouses an instinct or dread or some form of natural prejudice in the presence of some thing or event.

The present widespread study in this country of the child in school and in the family is due, more than to any one else, to the enthusiastic efforts of Dr. G. Stanley Hall. The study has become so general and is so wisely managed at various centres, especially the pedagogical chairs in universities, that new harvests of observations are reaped annually or semiannually. I mention these facts in order to explain that a summary of what is discovered to-day may not do justice to

* The reader will think of the list of the dwarfs in the *Völuspâ*, commencing with the eleventh strophe, and there will come before his mind little children standing around the solemn ceremony that was to determine the fate of the prisoners, and he will fancy how these children, going away from the ceremony, would mimic its counting out, converting the solemn ceremonial into some game of tag, the tag signifying symbolically the blow by which the enemy is killed or the prisoner captured.

what will have been discovered five years hence. This is especially true in regard to pathological facts—that is to say, facts which relate to abnormal development and diseases. As regards the normal development of the child and his education, it must be admitted on all hands that the results of the new studies do not change very much the theories already a long time in existence.

The theory of education rests on two pillars. One is the study of the ideals of civilization and the demands of the institutions in which the future man or woman is to live his or her life; the other is the study of the child in order to discover in him what rudimentary tendencies there are, favourable or unfavourable to culture, and to ascertain the best methods of encouraging the right tendencies and suppressing the wrong ones.

It naturally happens that some of the most enthusiastic investigators would persuade themselves that child study is all that is necessary to furnish full data for the founding of a complete theory of education. Such persons borrow from other investigators—or oftener from the current practice about them—their opinions regarding the branches of study, their co-ordination or subordination, and they borrow, moreover, from the teachers who have taught the traditional branches in school for the most part the methods which have been discovered to teach effectively these branches. A little consideration will lead one of them to the conviction that the course of study, the needs of civilization, and the art of

teaching should require new investigations made with the same thoroughness and persistence that now characterize the exploration of the field of child-study.

It is a gross error to suppose that an inspection of the childish mind alone will give one all the data needed to fix the course of study and the methods of instruction. It gives only one factor, only one of the essential data. On the other hand, it would be quite as absurd to suppose that the determining of the other datum—namely, the contents of civilization and the methods of educating the child into the future citizen—would suffice without the datum derived from child-study. Without special child-study educational writers have depended on the stock of general experience. It is of course true enough that human experience contains very much knowledge regarding children, but scientific research is the only thing that will widen this knowledge and make it precise. I have already said, in another place:* “The characteristics of accuracy and precision which make science exact are derived from quantity. Fix the order of succession, the date, the duration, the locality, the environment, the extent of the sphere of influence, the number of manifestations, and the number of cases of intermittence, and one has an exact knowledge of a phenomenon. When stated in quantitative terms each one’s experience is useful to other observers. It is easy to verify it or to

* Vol. vii of this series, p. vi.

add an increment. By quantification science grows and grows continually without retrograde movements."

In America Prof. Compayré is already one of the best-known writers on the subject of education through the translations of his excellent *History of Pedagogy*,* and his works on educational psychology and methods of instruction.

The remaining chapters of this work (from X to XVI) will follow in a second volume. The subjects of these chapters are: X, Judgment and Reasoning; XI, Learning to Talk; XII, Voluntary Activity—Walking and Play; XIII, Development of the Moral Sense; XIV, Weak and Strong Points of Character; XV, Morbid Tendencies; XVI, The Sense of Selfhood and Personality.

Miss Wilson, the translator, joins the editor in acknowledging the valuable assistance given by Prof. Elmer E. Brown in reading the manuscript and making suggestions leading to a more faithful rendering of the text of the author.

W. T. HARRIS.

WASHINGTON, D. C., *June 20, 1896.*

* Published by Messrs. D. C. Heath & Co.

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THE INTELLECTUAL AND MORAL DEVELOPMENT OF THE CHILD.

INTRODUCTION.

THE child has always been loved, caressed, and flattered by mothers; poets have sung his praises, and have extolled the grace of his smile:

Il est si beau, l'enfant, avec son doux sourire,
Sa douce bonne foi, sa voix qui veut tout dire,
Ses pleurs vite apaisés !

Painters have depicted with great complacency his little pink, well-rounded body, giving him, almost to deify him, the wings of love. In every age, too, the child has been cared for, trained, instructed, watched over by hygienists, scolded and lectured by pedagogues. But with all this care and vigilance, with all this worship of which he has been the object, people seem to have forgotten until now to study *him*, to observe him in himself, in the humble beginnings of his intellectual and moral life, and psychologists even have hardly concerned themselves with him. People have tried only to load him down with lessons, never thinking that in him

lay the power, by virtue of his unvaried simplicity, of giving us at least our first lesson in psychology.

But things have changed now. In Germany, in England, in France, numerous works have brought "the psychology of the child" into vogue. Fathers and mothers, especially young philosophers, have begun with laudable earnestness to keep a journal of the actions and movements of their children. The observations are multiplying on every side. "Among all the new fields of investigation which modern science has opened, there is none more inviting," says James Sully, "than that of child study."* We shall be pardoned for having yielded to this charm, and for trying, by publishing our thoughts and our personal experiences, to contribute our part to the progress of a class of studies whose success is henceforth assured.†

How, indeed, can one help taking hold of such a subject? How fail to comprehend its interest?

* James Sully, Introduction to the English translation of Perez's book, *Les trois premières années de l'enfant*.

† The work in hand dates back several years. In 1878-'79, when on the faculty of letters of Toulouse, I devoted all my public lectures to the study of childhood, and the *Revue philosophique* for May, 1880, said: "Our co-worker, G. Compayré, is preparing a work on the Psychology of the Child for publication." Circumstances caused the work to remain in embryo, and the rule of Horace, the "*nonnumque prematur in annum*," was forced upon me. I do not regret this, since, thanks to the delay in the final edition of my book, I have been able to profit by numerous and interesting works which have appeared on this same subject during the last ten years.

If childhood is the cradle of humanity, the study of childhood is the natural and necessary introduction to all future psychology. More than one obscure question of general philosophy may be cleared up, or at least simplified, by the revelations with which the history of the first years of life furnish us. It is there, for example, that we must look for the solution of those commonplaces of philosophical controversy, the question of the origin of ideas, and that of the origin of language. "We do not understand childhood," wrote Rousseau; and in deploring our ignorance on this point he made it responsible for so many vain systems of education, works of senseless imagination constructed on the *a priori* basis of religious dogmas or of philosophical hypotheses. There is no doubt but that we must attribute to the same cause, to the same ignorance, many errors spread abroad by the systems of philosophy on the nature of man. The exaggerations of those who declare themselves to be in favour of the theory of absolutely innate ideas and sensations, or of those who refer everything to experience, can not hold their ground when we confront them with the child. A few facts borrowed from the progressive evolution, from the spontaneous development of children's faculties, will be sufficient to silence the idealist's conception of a soul completely formed, possessed of all its attributes at the outset, as well as the theory of the realist, which presents the mind as inert, passive, deprived of all activity in itself, and a slave to sensation.

It is this fact that Reid has so clearly grasped. The Scotch psychologist did not hesitate to draw a parallel between the profit to be derived from child study and the results of the systematic speculations of philosophers; he even placed child study in advance of philosophical speculations.* “If it were possible,” he said, “to get a clear and complete record of all that goes on in the mind of a child, from the beginning of his life and of his sensations to the moment when he uses his reason, a record from which we might learn how our infant faculties worked, how they produced and developed all the ideas and all the sensations that we find in ourselves when we have arrived at the age of reflection, this would be a treasure in natural history which would probably shed more light on the faculties of man than all the systems of philosophy that have been written on this subject from the beginning of the world.”†

But it is not alone a care for the progress of

* Reid, *Inquiry into the Human Mind*, Introduction. To be sure, Reid did not believe in the possibility of these researches, which, he said, “Nature has not put within our power.”

† If the psychology of the child is called upon to render real service to general psychology, we must not forget that, on the other hand, the psychology of the child would not be possible, except in the light of general psychology and of the revelations which the latter owes to the adult consciousness. “The idea of motion, of variation, of evolution,” said Paul Janet recently, “will be introduced more and more into psychology, either from the point of view of time, from the point of view of the history of societies, or from the point of view of abnormal changes; these comparative studies, however, do not exclude, but even

philosophical speculations that should recommend and bring into repute what might be called *paidoscopy*.* There are other practical and positive results to be hoped for from the study of the child. I remember hearing Marion, in one of his lectures at the Sorbonne, on the psychology of the child, lay stress upon the æsthetic interest of his subject. "Children," he said, "are the men of to-morrow; they will see what we can only predict, what we can not even predict; they will participate as witnesses, as actors, in events which we do not even suspect." Hence the dramatic charm, so to speak, which makes the actions of the child so poetical, the charm produced by a drama just begun, when one does not know the ending. But what is still more interesting and important than the poetry of childhood is the help which a minute analysis of the child's faculties brings to psychological and moral studies; these are the gains and benefits of the educator and of the moralist. If it is true that children carry the future of humanity in their little hands, it is no less true that in developing their mental and moral faculties more perfectly we may modify this future and improve the moral destinies of the human race. But how are the principles and rules of this better education and this more

demand a unity, a basis of comparison, which is the normal and fully developed man." (*Revue des Deux Mondes*, July, 1892.)

* We risk this barbarism, in imitation of Émile Faguet, who invented *néaniascopie* to signify the investigation undertaken by so many of our contemporaries, on the state of the soul of French youth.

effective moralization to be established, if we have not tried to penetrate the secrets of the child's nature, and to clear up the mysteries of the evolution of the soul ?

Listen to the child ! He cries out with all his might that he needs help and support, that he can do nothing by himself ; that, like the animals, he would not know how to do without his parents.

While herds, meantime, and beasts of various name

Flourish at ease ; no rattles they require,

No broken lullaby of dandling nurse . . .

Earth and Nature boon,

To each according every latent wish.*

This "Nature boon" provides for the child, too, but only on the condition that she be sought and upheld. This book will show on every page the insufficiencies of a spontaneity which, though real, is nevertheless unable to accomplish its work by itself, without the co-operation of educators. And, at the same time that it is making us understand the necessity of interfering in one way or another in the development of Nature, the psychology of the child shows us the means for directing this interference with precision and with efficacy. Physicians do not hesitate to state that, in order to ameliorate the race, from a physical point of view, it is necessary to use the teachings of embryogeny, and to examine thoroughly the laws of the anatomical and physiological evolution of the human body, to the end

* Lucretius, *De Natura Rerum*, J. M. Good's translation, Book V.

that they may deduce from them the prescription of hygiene adapted to the case. Practical philosophers who wish to form and direct the mind will be convinced more and more that their efforts would be vain if they had not begun to learn at the child's cradle in what paths education should be led, in order to aid Nature while following it, to govern without cramping it, and to what spontaneous forces they must give free scope, to what weaknesses bring aid.

The trouble is, that the construction of an infant psychology is not less difficult than it is necessary. The difficulties of research of this sort are so great that people even deny its possibility; the character of it is so delicate that they question its legitimacy.

We might name a distinguished philosopher of our own time who, in the timid sensitiveness of his religious faith, will not hear infant psychology spoken of. The genesis of the soul is, in his eyes, an act of the creative power which it behooves us to respect, a mystery of Nature which is profaned by almost sacrilegious indiscretion when we pretend to tear away the veil that covers it. Is it necessary to say that this kind of modesty seems unintelligible to us, that it is, to say the least, antiscientific, and that, before denying to philosophers the study of the beginnings of the intellectual and moral life, it would be necessary to have first refused physicians the right of ascertaining the laws of generation, and even of practising the obstetric art?

The objections that bear, not on the propriety

of our studies, but on the difficulties in carrying them out, are more serious.

“Let us see,” people say to us, “what means of information you have at your disposal. The psychology of the adult rests essentially on the consciousness of the self which is prolonged in the memory. This instrument is lacking in the psychology of the child. You have nothing to expect from inner observation, from personal reflection. You pretend to know the child, and the child does not know himself! Nothing remains in your memory of what you did, or thought, or felt, during the first years of your existence. Of the characters which daily action or experience inscribes on the consciousness of the child, as soon as he has a consciousness, no trace remains; a deep oblivion hides them. You can not regain possession of your childhood, and you are reduced to conjecture from without what takes place within the consciousness of the child whom you are observing. This external observation, the only possible, you will easily recognise, has all the faults, all the uncertainty of an interpretation, of a translation. You do not read in the soul of the child, except through its material covering. His motions, his gestures—later, when he can speak, his words—are only signs to which you attribute by analogy with the phenomena of your own consciousness a meaning which perhaps is not always exact. You are obliged to confess, yourself, that the signs of expression of a child are often disproportionate to the real intensity of the feeling that they express, that he

gesticulates more than he feels, that he talks more than he thinks, that in his apparently most intelligent discourse there is sometimes nothing but the chattering of the paroquet, which repeats words without understanding them. Admit, then, that your methods of investigation are uncertain, that the greater part of your conclusions are hypothetical, that they leave you exposed to inexactness and to error.

“ Besides, it is not only your process of observation that will bring disappointment to your good intentions. Other difficulties spring from the very nature of the object you are trying to analyze. At first, the phenomena that you study are unconscious, in part, if not in whole; in order to know them, it would be necessary to rob the invisible vibrations of the nerves of their secret. They are performed in the depths of an organism which your glance can not penetrate. And when they have become conscious, when a ray of intelligence vague and undefined lightens them, they are none the less difficult to grasp; for they change and are modified incessantly. They are the most variable, the most fugitive things in the world.*

“ The faculties of the adult having been developed and fixed in their definite forms for a long time, are, so to speak, in repose; you have leisure in which to consider them in all their aspects.

* “ Everything is so fleeting, so vague in the child, that the observer who would try to fix his uncertain features would soon be overcome as by vertigo.” (Mme. Necker de Saussure, *L’Education progressive*, Book II, chap. i.)

But in the case of the child one phenomenon has no sooner shown itself than it gives place to another, which not only differs from it, but which is often its very opposite; what was unconscious yesterday is conscious to-day; in a flash of time an instinctive action has become a voluntary one. The child's soul shows the most diverse colours in a few moments. Everything in it is change, perpetual evolution. How could you build anything solid on this moving foundation? How evolve a fixed and durable image from a sight that is renewed at every instant? As well try to photograph the flight of birds or the march of an army! You can, at most, by your successive observations, gather together a series of instantaneous views, from which it is very difficult to deduce fixed laws and general truths."

We do not conceal from ourselves the import and force of these objections; but they are not of a nature to arrest efforts or to discourage the hopes of the psychologists who would study the child. They ought to make them cautious, distrustful, eager to surround themselves with every precaution in verifying, in registering their observations unceasingly, and in drawing inferences with prudence. They point out real obstacles, but these obstacles, however difficult they may make the attainment of the object sought, do not make it impracticable.

In the first place, it would be wrong to suppose that external facts directly observed in the child have not in themselves a psychological value. The life of the mind is not concentrated

entirely in the consciousness. A psychic act, in its complete development, contains three elements: an antecedent in the nerves, an internal act of consciousness, and an outward movement. But this series of three terms is not always complete; with the exception of the first term, which is the indispensable condition, it is either the second or the third that may be lacking. In the unconscious phenomena which exist in minds of all ages, but which, above all, the obscure beginnings of the child's life present, the gap results from a lack of consciousness. In the life of the adult, when the habit of reflection is fixed, when the current of inner thought is permanently established, it is the third element, the outward manifestation, which is most often wanting. The phenomenon ends with the consciousness; nothing reveals it to the outside world. But the child hardly knows these inhibitions, this staying of the thought and feeling turned in upon themselves. The slightest pulsations of his mind, so to speak, reflect themselves upon his physiognomy. His expressive and, as it were, transparent consciousness flashes forth, at first in gestures, later in his babbling. Hence the particular interest which the observation of his outward movements offers, the sincere expression of his mental activity. Besides, these motions which we can follow and note with exactness—however slight may be the attention we give them—are in themselves psychic facts; and only to have described and analyzed them, without going back to their source, would be psychology in itself.

We should not look with disdain, then, upon this study of the child from without, even if it should be denied all introspective import as to the interior of his mind, and if it should not serve as an inductive instrument for getting at the hidden operations of his consciousness.

It is true that the external observation of the child's actions could not in any case acquaint us with the nature of the phenomena of the nerves and muscles, on which depend the intellectual and moral phenomena. But if that were a serious argument against the possibility of the psychology of the first years, the same argument would hold against all psychology. Is not internal observation, the instrument of adult psychology, also powerless in revealing to us the depths of consciousness? And yet the most conscious, the most thoughtful acts of the mature man, carried on in the full light of the inmost reason, have their roots, or at least their antecedents, in the foundations of the nervous organism quite as much as the half-conscious sensations and emotions of the newborn child. From this point of view, the psychology of the child may be entered upon with no greater handicaps than the psychology of the adult. In both cases it is to anatomy, to physiology, that the psychologist must resort, in order to complete his information of the nature of the facts that he observes.

There remains, it is true, this obvious disadvantage—namely, that the child's consciousness, impenetrable in a sense, like all consciousness, is neither distinct enough nor reflective enough to

study itself and to account to itself for its acts. Induction alone permits us to explore this invisible world. But are these inductions, then, so rash that we should hesitate to make use of them? We have to fear neither dissimulation nor disguises in the child. Nothing changes the perfect transparency of his sincerity. His eyes are indeed the mirror of his soul. He is all unconstraint, all trust; he would not know how to have secrets from the scrutinizing gaze of his observer.

A pleasing writer, Anthoine, has called attention to this fact. "I have heard it said that a psychology of the child has not been framed. Why? Is the child more difficult to fathom than the man? If I may judge from my own recollections, I should say 'No.' As a child I lived with a mother and sister from whom I never could hide anything; they read me as they would read a book opened wide. I should have tried in vain to conceal anything from them; they would have discovered my little tricks and ruses very quickly; when they fixed their eyes upon mine (oh! that clear gaze—after so many years have passed I see it and feel it still), I was conquered immediately. I gave myself up. They knew me better than I knew myself; how many times have they compelled me to go back over the course of my inward deliberation, to find, beneath the pretexts with which I pretended to satisfy others and myself, the true motive for my conduct, the one that had determined it."*

* M. Anthoine, *A travers nos écoles, souvenirs posthumes*. Paris, Hachette, 1887, p. 16.

Anthoine continues his informal account, laying stress, and rightly, upon the power of penetration that a mother's eye acquires, fixed with a sweet determination upon one she loves. The force of the tenderness creates between the parents and the child relations so close, a moral intimacy so deep, that the faintest heart beats of the child re-echo in the ears of those that love him. Paternal and maternal love carry with them a sort of divination. How easily we divine the slightest thoughts, the most fleeting sensations of these little creatures, always followed step by step by the sympathy of the mother. Mme. de Sévigné said to her daughter, in a burst of tenderness, "I suffer in your lungs." A father and a mother, affectionate and attentive, can almost say to their child, "I feel your emotions! I am conscious of your thought."

We feel that the best psychologists of childhood are those who have followed carefully, from hour to hour, the moral development of their own children; but we do not mean to exclude bachelors from taking part in these researches, nor to deny them success. If we had the slightest desire to do this the results already obtained would rise in contradiction. One example will suffice, that of Bernard Perez. He has observed only the children of others, but has, nevertheless, written some interesting and instructive books on this subject. The child's consciousness does not shield itself from the observer, whoever he may be. There is no necessity for violence in order to penetrate into his soul, open to every comer, and offering

itself, so to speak, without resistance, to all indiscretions.

If the journals kept by a mother* or a father, in which a careful hand registers from day to day the smallest incidents of the child's existence, are really the most precious sources of observation, all information, wherever it comes from, is welcome. Indeed, there is no subject which, by the complexity of the questions which it raises, demands more imperiously a variety of experiments, each completing and controlling the others. The psychology of the child is a complicated work, whose success can not be attained unless many workers take hold of the subject. Individual observations, however minute and methodical they may be—for instance, those of Preyer, on his son Axel—apart from the fact that they may be perverted by prejudices, are necessarily incomplete, and at some point inexact, because they apply to only a single individual. The evolution of the child's faculties is, moreover, too rapid for a single observer to be able to take account of all of its steps at one observation. How often, in observing our own children, we have succeeded in establishing only the impotence of our own efforts! The phenomenon we were trying to understand had disappeared before it was possible for us to grasp it. A question was stated, and we thought we were on the point of answer-

* Mme. Necker de Saussure recommended them fifty years ago: "I strongly urge young mothers," she said, "to keep an accurate record of the development of their children."

ing it; but time had followed its course, the stage of the development corresponding to the question to be solved had passed, and our observations having advanced more slowly than Nature, the evolution, whose mystery we had hoped to take by surprise, was closed before our solution was found. In order to achieve our purpose, it would have been necessary to have another living example at hand, laid hold of at the point where our investigation had to stop—where the first subject failed us. But our library did not contain another volume, and we were compelled to apply elsewhere. That is why a constant renewal of the same observation is necessary in the psychology of the child; the studies begun by one can not be finished except by others, and the successive shades of a perpetual growth can not be noted in their details nor comprehended in their entirety except when patiently examined in a number of individuals.

Can the observer resort to experiment in his examination of the child? The successful efforts in this direction of Preyer and Binet, to mention no others, permit us to answer in the affirmative. But these little tests to which the child is subjected could have no bearing on any but the very limited and very superficial parts of human development—for instance, the perception of colours or the appreciation of distances. They could not reach the inmost and essential foundations of the mental evolution. The only truly decisive experiment would be to isolate a child, to separate him from all social environments, to let him grow

by himself, without help of any sort, as Herodotus tells us a king of Egypt had conceived of doing. We could see then just what Nature might do when thrown on her own resources, and could draw the line sharply between the influence of education, social suggestions, and the spontaneous action of heredity or of inborn tendencies. But who would allow such violence to the natural order of things to be committed on his child! If child study should undertake to carry out the work along this line, it would then indeed justify the anger of those who consider it a profanation of the holy works of Nature, and almost a crime of high treason against childhood.

Permissible and possible experiment, then, can not go beyond certain limits, which are controlled by consideration for the child, a fear of encroaching on the rights of a nascent personality. And under these conditions it is evident that experiment can afford us but a very feeble increase of light. It must be noted, moreover, that even when carried on with discretion and propriety, experiment presents a serious inconvenience, in that it modifies the subject to which it is applied to the point of changing and even perverting the regular course of Nature. In the case of a child that has been subjected from his birth to a continuous system of experiments, on the visual operations, for instance, the vision will certainly develop more rapidly than in children upon whom no experiments have been performed. Preyer confesses this. Having found that his son's eyes followed a bright object on the twenty-

fourth day, when usually the faculty of fixing and of removing the glance did not appear till later, he writes: "I had made, it is true, almost daily experiments on this point from the first day, and these experiments perhaps hastened in Axel the formation of the mechanism of the convergence of the eyes."

Certainly the best experiments are those which Nature herself has instituted, in offering us, in the diversity of temperaments and of individual types, different forms, some rapid, some slow, of the same evolution. These natural experiments are still more significant, more instructive, when a gap, a lesion of the organism, a constitutional weakness, any cause whatever of disturbance, as it were, maiming the human soul, impeding the scope of the faculties, lets us see the consequences of the abortion of an organ, of the atrophy of a sense, or else, by arresting the development, renders a transient stage of normal evolution permanent. We shall have to resort to the psychology of idiots and imbeciles, and to that of maniacs, for more than one piece of useful information. Decidedly abnormal states of maturity are often but the exact representation of one of the periods of transition, one of the fleeting states through which the child passes in his regular growth. And, in the same way, animals, whose history, it has been said, was that of thought before man, and which are, as it were, Nature's first outlines of psychic organization, will help us, by comparison, to understand some of the child's actions. The admirable works of Romanes, *Animal Intel-*

ligence and Mental Evolution in Animals, contain more than one suggestive consideration by which we have profited.

With these manifold sources of information we should not despair of succeeding some day, after numerous repetitions and incessant revisions, not only in describing exactly, but in explaining with certainty, the evolution of the child's faculties. Clever essays, and even works of considerable extent, have already appeared. The best proof that the subject is an attractive one, and that the work is practicable, is that child study is the order of the day; that physiologists and psychologists everywhere have undertaken it, have boldly opened the way, and have approached, if not reached, the goal.*

It would hardly be fitting for us, about to undertake a work of a similar character, to point out the ways in which the efforts of those who have gone before us have failed, efforts that have

* The most important works on this subject are : A Memoir by Thierry Tiedemann, translated into French by Michelin, dating from 1781 ; A Biographical Sketch of an Infant, by Darwin (Mind, July, 1877) ; E. Egger, *Observations et réflexions sur le développement de l'intelligence et du langage chez les enfants*, Paris, 1878 ; Bernard Perez, *Les trois premières années de l'enfant* (translated into English by James Sully) ; Preyer, *Die Seele des Kindes* (translated into English by H. W. Brown, and published in two volumes, *The Senses and the Will, and Development of the Intellect*) ; also, *Studies on the Language of Children*, published by Pollock, in Mind, July, 1878 ; Taine's article on *L'Acquisition du langage*, in the *Revue philosophique* (vol. i, No. 1), and the *Observations of Ferri*, in the *Filosofia delle scuole italiane*, October, 1879 and 1880.

rendered our own comparatively easy. We would rather call attention to their merits and to what they have accomplished. Any one that has read the biographical sketch in which Darwin has summed up his observations on his son Doddy will realize that it is not possible to condense into a few lines a large number of striking and distinct facts, and that the illustrious English naturalist could have written the history of the origin of the soul with more certainty and more confidence than that of the origin of species. Egger, in interpreting the marks of family, has shown how philological knowledge can serve to throw light on the study of the progress of language, and consequently of intelligence. Taine, in a few pages, too brief, but very rich and very full, has successfully applied the method described in these words: "Little facts, well chosen, important, significant, fully substantiated, and minutely noted—that is the material for all science to-day.* We bow before Preyer's book as a monument of Germanic patience, the richest collection of observations that we possess thus far.† And finally Perez, with his abundance of anecdotes, collecting on all sides everything that concerns the life of children, on their way home from school, in the squares where nurses take the babies for airing, even in the newspapers, has done much to spread abroad, to popularize the

* Taine, *L'Intelligence*, preface.

† Preyer observed his son for three years "every day, morning, noon, and night." (See preface.)

studies to which he has devoted himself with persevering and passionate ardour."

But it is not only in special and, so to speak, technical works that we must look for material for our work. Let us not say that child study is an entirely new thing. The elements, some elements at least, have existed for a long time in most works on the education of childhood, notably those like the memorable works of Locke and Rousseau,* that have sprung from a philosophic mind. Every educator worthy of the name has been compelled by the needs of his subject to say a few words at least on the nature of the child. In the same way memoirs and autobiographies are useful sources of information. It must be borne in mind, however, in this connection, first, that the imagination of the mature man, when he returns in thought to his childhood, is inclined to embellish, to transfigure the vague remembrances of his first years; in the second place, that it is only great writers who have conceived the idea of recounting the beginnings of their lives, the exploits of their young days, and that consequently in accepting their accounts to the letter we should probably gain an exaggerated idea of human nature, and might know in the end only the psychology of prodigies.

If there is still some indecision on the question of methods to be employed, there surely can

* What is the *Émile* of Rousseau if not, as Maine de Biran has already remarked, "a sort of practical psychology in all that concerns the successive order of the development of our intellectual and moral faculties"?

be none on that of the end to be attained. It is not a question merely of drawing children's moral portraits, like those we find in Dupanloup's *L'Enfant*, portraits of the poetic or humorous imagination, such as Champfleury and Gustave Droz have sketched in their books on the child, or Gavarni in his legends of the *Enfants Terribles*. It is a question of drawing a complete picture of human nature in its beginnings and of its evolution. One of the founders of infant psychology, Tiedemann, attached great importance to the question of dates: the child followed a light with his eyes and distinguished objects on the thirty-sixth day; he smiled or cried the sixteenth or seventeenth week. A psychological chronology, certainly, has its importance. But Tiedemann himself recognises that it is impossible to establish general and absolute rules on such a subject. There is such a difference between one child and another with respect to precocity* that we do not learn much when told that "Doddy" made his first sound, as though trying to speak, on the hundredth day; Axel took his first step at fifteen months. By multiplying experiments one might, at the most, arrive at an average which would not be without value.†

* Pollock calls attention to this fact in his paper on the progress of language: "Children differ so much in forwardness that the time of particular acquisition seems of little importance as compared with their order." (*Mind*, July, 1878.)

† It is well to add, moreover, that even in an individual existence it would be useless to try to establish an exact date for the appearance of such and such a faculty; the faculties, far

But what has altogether a different interest from the question of dates, is to determine under what circumstances the smile or the tears appeared, under what conditions and what forms the first words and the first steps were produced ; it is, in a word, to determine the order of development of psychological acts, an order whose course can be quickened or slackened, but which in itself, in the succession and connection of the phenomena which compose it, is always the same, and remains invariable from individual to individual.* Evidently there are laws of Nature which govern the birth of faculties ; the whole question is to determine these laws.

What is the limit, what is the final point at which our research shall end in the investigation upon which we are about to enter ? We do not go beyond the age of from six to seven years ; six the school age, seven the theologic age, the age when "sins count." Egger carries his observations to the tenth year, and if he does not go farther still it is because, as he says, "from this time on, the number and variety of the operations the child has learned constantly restrain the free and natural play of the faculties." This reason,

from having a sudden birth, always require a long, slow preparation.

* "One child develops rapidly, another slowly. Very considerable differences are found even in children having the same parents ; but these differences concern time and degree more than the order of succession, and of the appearance of the different phenomena of development, for the essence of these phenomena is identical in all." (Preyer, Preface.)

were it the only one, would be enough, it seems to us, to cause us to stop much earlier—at the latest, when the child enters school. First childhood is usually considered to extend to the seventh year.* But from the point of view that interests us, childhood proper, the formation period, ends a little earlier. It is the first three or four years that are most important to those studying the evolution of the different psychological functions. At four years the child is, doubtless, still one of the most frail of creatures, very ignorant, and void of reason. Nevertheless, he is already in possession of all of the essential elements of his future activity. He has acquired the use of all of his senses, and the outside world is opened to him. Locomotion and language have put him in direct communication with material things as well as with his fellows. The different forms of intelligence, from perception to reasoning, have made a beginning in his consciousness; and the baby not yet admitted to school already knows how to judge and reason in his own way: with inexact premises, and often with ridiculous conclusions; never mind, he has a logic of his own. Neither selfish passions nor warm-hearted emotions are strangers to him, and his little will makes itself known, be it only in his caprices, the battles which the budding independence of his character wages against the will of grown people. All sides of human nature, in a word, are represented in this soul of four years.

* "*Infantia primos septem annos ætatis habet,*" said Stahl.

The different paths of activity are sketched out. The child has but to advance with a firmer step each day, under the action of education, more and more effective and decisive as time goes on. And that is why our observations cease as soon as he begins to learn to read and to write, at the moment when the pupil succeeds the child.

The facts that we have gathered together from others, as well as those borrowed from our own personal experience, have been distributed and classified under the ordinary heads and divisions adopted by general psychology. All that can be said further in favour of this traditional distribution of material is that no other is possible. We were inclined at the outset to adopt a general division in two distinct parts: we would have studied "the child before he can speak," and "the child while learning and after he has learned to speak." But the difficulties in carrying out this plan obliged us to give it up, although doubtless it would have had its interest. We should have had to return to two considerations of the same faculties—to consider, for instance, memory or imagination before and after the acquisition of language—and would have doomed ourselves to constant repetitions. Whatever influence language may have on the development of thought, it does not constitute a sharp line of division.

To tell the truth, it would be better to have no divisions at all. What a contrast there is between the reality and the image we are trying to make of it, between the model and the copy, between the child in his living unity, developing

harmoniously and simultaneously all his powers of body and of soul, and the piecemeal, fragmentary studies to which the needs or wants of analysis reduce us! But this is a fault common to all scientific research. And these necessities are perhaps more imperative, just as the inconveniences resulting from them are more apparent when the question is one of the history of the child—that is to say, of a being that is not yet wholly formed, whose faculties are being organized, in whom the different phenomena, one obscuring and effacing the other, constitute, as it were, the successive texts of a palimpsest, written one over the other. We are far, therefore, from having reached the period of complete differentiation which will characterize maturity. We assist in a sort of fermentation, in which everything is mingled and confused. So that, in order to know where we are, it is so much the more necessary to multiply the distinctions, the divisions of the analysis, and to apportion out in the compartments of a dry nomenclature facts which Nature, ever active, has united and associated. You will complain, perhaps, of finding too many little things, too many trifles, in this work. But the psychology of the child can not be more than a collection of little acts, so small that we sometimes ask ourselves where we shall find words discriminating enough to describe them. These little things are great, moreover, because of their results, inasmuch as they contain the germs of the future soul, and of all development of the human personality. Finally, they partake

of the charm that is attached to the beginnings of everything, and more particularly to the beginnings of what the poet calls "a frail hope of the soul." We shall be satisfied, for our part, if we succeed in investing the pages of this book with something of the sweet charm of the child, and in communicating to our readers a little of the pleasure which we have found in studying him.

CHAPTER I.

THE NEWBORN CHILD.

- I. The observation of the child should begin at birth.—Different reasons for the necessity of determining exactly the state of the newborn child.—Is there a psychology of the fœtus?—To what are the psychical phenomena of the intra-uterine life reduced? To a few tactile sensations and a few motions.—Frarière's *Education antérieure*.—Malebranche's opinion on the communication between the mother's brain and that of the child.—Cabanis's opinion. II. Infant psychology does not begin before birth.—The starting point of the psychic life is almost zero.—The automatic and instinctive life of the first days.—Development of hereditary germs.—The normal child and the idiot.—Particular characteristics of instinct in the little child.—Compared with the instinct of young animals.—The child's weakness.—At what moment does consciousness begin?—Painful sensations exceed the agreeable sensations at first.—Observers have laid stress on the child's sufferings.—There is another side to this question, and Nature has provided the child with some impressions of pleasure.

I.

I HARDLY know how to say, without being commonplace, that there is no more interesting moment to study in the life of the child than that in which he comes into the world, when his little body, like a ripe fruit, is detached from that of his mother. "The child is born when

his body is prepared for an independent organic life."* Being adequately equipped by Nature, in spite of the weakness and delicacy of his organs, to live henceforth his own physical life, and to face the struggle for existence, the newborn child, who is about to breathe, to be nourished—in a word, to perform the different functions of the material life—is already, in some ways, in addition to this, a sentient being. A principle of spiritual animation exists in him from the very first, and shows itself in distinguishable ways. It is not too soon, then, to question this newcomer, who appears on the scene, to play in his turn and in his own way the *rôle* which so many millions of creatures have played or will play in the course of time. And we can not but recommend to the imitation of psychologists the example of the diligent and eager observers, like Mr. Preyer, who lose no time, who do not wait even till the child has had five minutes of existence before taking him to the window to see what effect the light of day exercises upon his eyes; who do still better than this, even, since they anticipate the complete birth, and profit by the fact that the child's head appears first, to experiment upon the force of his instinct of suction by putting the end of his finger in his mouth.

Under what conditions, with what apparent germs of his future faculties does the child take possession of existence? What badges does he wear upon his forehead to announce his destina-

* Roger de Guimps, *Le Livre des mères*, 1862, p. 17.

tion in advance? Has he any vague consciousness of the life that is just beginning? Are his senses organized and ready to act? Is his feeling, of which he gives undeniable proofs at the outset, shut up in a circle of painful impressions and of suffering? Or is it already accessible to comfort, to pleasure? In a word, what is his moral state, if the word is not too ambitious for a poor little, almost unconscious being who will have for a time but two occupations, eating and sleeping?

Such are the many questions to be considered, which doubtless can not be exactly solved except by an analytic study of the different kinds of phenomena, but at which it is necessary to glance, as a whole, before taking them up in detail. And that for two reasons, drawn, one from the child's future, the other from his past, for he has a past even now; from his future, since it would be impossible to follow the subsequent evolution of his faculties with precision, if we did not begin by forming a clear idea of his starting point; from his past, since only an exact appreciation of the natural gifts that he possesses at his birth can assist us in clearing up, within the range of the possible, the obscure history of the nine months of gestation, and in judging of the value of the suppositions and fancies which the imagination of some dreamers has been pleased to venture on the characteristics of the intra-uterine life.

Let us begin by establishing the fact that the first days—at least the first hours—of life constitute a period of crisis, and a change of condition

which has profound reverberations in the body and in the mind of the child. The independent life of the newborn child is evidently not a continuation, with the same characteristics, of the foetal life. When a river that has been subterranean finally comes to flow above the surface, its waters, although they now reflect the rays of the sun, preserve, nevertheless, with the new flashes of light, the same system and the same gait. It is different in the case of the child, for whom birth is equivalent to a veritable metamorphosis. He has changed from a parasite to a personal human being; he has become individualized; he lives by himself.* His heart, which a short time ago was beating a double time, now beats triple time. His lungs, up to this time inactive, are beginning the seesaw motion that ends only when life ends. On the other hand, his senses, which have been shielded from the action of the outside world, are exposed from this time on to continual solicitations; a flood of impressions of every sort bursts upon the frail creature, threatening to bruise his delicate organs, and to provoke those momentary troubles called convulsions. His body, which has been surrounded by an equal heat, sheltered from the air, is now exposed to the variations of temperature, to the influence of cold, which, if too intense, will cause a peculiar

* "The first sleep of the newborn child forms a transition between the intra-uterine existence, which is closely bound to that of the maternal organism, and a mode of existence relatively more independent." (D'Ammon, *Livre d'or de la jeune femme*, Paris, 1891.)

malady which the French call *silérine*. His limbs, which were almost immovable in the narrow prison that inclosed them, stretch themselves out comfortably and test their power of unrestricted motion. There is in all these changes, in this general transformation, in this adaptation to a new medium, a process full of difficulties and of dangers, a period of transition, possessing its own characteristics. In view of this fact physicians divide first infancy into two periods: the period of the newborn babe and the period of the child at the breast.

If it is important that the psychologist's observation should be directed first toward the threshold of life, it is because the child, as we have said, when studied and observed from the very first hour, tells us in a certain degree, although confusedly, what has taken place in the intra-uterine life, what the child has felt from the very beginning of his existence. In any case, it teaches us at what point the anterior psychic development was definitely arrested, if there can have been a development of this kind.

According to certain philosophers, there would be a psychology of the foetus, and the first page of the book of the child—that is to say, the one containing the description of the newborn babe—would itself require an introduction, a preface of some length, in which the psychological secrets of the period before birth would be disclosed. It was an idealist, strange to say, that advanced this opinion. Malebranche did not hesitate, as he says

himself, to consider the child's brain in the mother's womb before examining what happens to it after birth;* and he admitted that there is a wonderful communication between the mother's brain and that of the child—a communication from which would follow, according to him, the particular dispositions of the imagination in each one of us.† The same discussion has been taken up in a comparatively recent work, *l'Éducation Antérieure*, by de Frarière.‡ It is the mother, in this account, who would be responsible above all for the nature of the child, and maternal influence would appear in a wholly new light.

But they go still farther. They are not content to advance the theory that in an unconscious way, and by mysterious relations, the brain of the foetus feels the influence of the mother's brain; they attribute a real mental life to the child before birth. Ribot, while declaring that the senses are in a state of torpor in the foetus—which is perhaps saying too little, for the truth is that they are not even completely organized—makes bold to affirm in explicit terms, after Cabanis, that the child before birth has already thought and willed; he gives only an insufficient

* This is the subject of Chapter VII of the second book of the *Recherche de la vérité*.

† Malebranche believed this intercerebral communication to be powerful enough to produce deformed children in consequence of a mother's disordered imagination.

‡ *Éducation antérieure, influence maternelle pendant la gestation sur les prédispositions morales et intellectuelles des enfants*, Paris, Didier, 1862.

proof of this, namely, that in the last stages of gestation the embryo moves.* A German author, Kussmaul, goes so far as to say that the intelligence begins to develop from the intra-uterine life; he adds, it is true, that it develops only very imperfectly. Perez, who cites Kussmaul, claims in his turn that the soul of the foetus, half formed, half active, is perhaps vaguely conscious.† He says in another place, speaking more positively, that direct experiments upon either the embryo or the child prematurely born indicate, at least for the last stages of gestation, a remarkable *ensemble* of faculties already qualified to enter upon their work.‡

It is hardly necessary to say that the facts cited in support of these hypotheses, of these exaggerations of statement, fall far short of justifying them. And Perez himself, in making a *résumé* of Preyer's book on the Special Physiology of the Embryo,§ does it in these words: "We can not deny that the foetus in the last stages of gestation may have, in point of common sensations, a feeling of pleasure and of pain, the muscular sense, and also hunger; there is the whole balance sheet of uterine psychology."|| These are meagre results, you will say; and for all that it seems to us difficult, in spite of the wonders expected from new experiments, plans

* Ribot, De l'Hérédité, first edition, p. 315.

† Perez, Les trois premières années de l'enfant, p. 3.

‡ Perez, Revue philosophique, June, 1887, p. 585.

§ Special Physiology of the Embryo.

|| Revue philosophique, 1887, p. 586.

for which are still to be discovered to go much farther than that.

It is with the elaboration of the material organism that Nature is silently occupied during the long months of gestation. The physiology of the embryo will consequently have interesting work before it to establish how the brain of the foetus is developed little by little, how the organs of the senses are formed materially.* But psychology proper has almost nothing to gather from this obscure period when life is being prepared for, not only because it is difficult to find out what is going on, but because, from the mental point of view, nothing, or almost nothing, is going on. It was allowable for Malebranche (thanks to the hypothesis of a soul completely formed, so to speak, in the very beginning) to believe that the child in the womb of his mother has the same feelings and the same impressions as his mother.† But when one is convinced, as we all are to-day, that the intellectual principle can not be developed, and can not act until it is provoked by excitations from without, that it remains inert in the state of a germ until the day when, like a ray of sun putting life into the grain

* On the development of the brain, see Charlton Bastien's *Le Cerveau organ de la pensée* (Paris, Germer Baillière, 1882, vol. ii), chap. xix, of the fourth book, *Développement du cerveau humain pendant la vie utérine*.

† According to Malebranche, the soul is not generated by the mother, but, absolutely independent of the brain, just as reason is independent of experience, it finds itself in full possession of itself at the very first.

sown in the earth, the sensation comes to vivify it, to set it going, to give it the initial movement, then one can not deceive one's self as to the pretended thoughts and volitions of the foetal brain.

We must not forget that the foetus is plunged in a deep sleep, in a lethargic state; and the proof of this is that the newborn child seems to find difficulty in shaking off this torpor, that, after having satisfied his hunger, he falls back periodically into sleep and lethargy. The psychic life is so little developed before birth that the awakened life does not yet exist. Some vague sensations, doubtless analogous to those felt by one in a dream, succeed with great difficulty in penetrating through the accumulated obstacles to the child. But to what do they reduce themselves? There can be no question of luminous sensations in the dark dungeon in which the child is confined; not even of acoustic sensations, whatever Cabanis may have thought about it.*

* Cabanis says: "It is necessary to call attention to the fact that the foetus may not be an entire stranger to two kinds of sensations, whose proper organs, however, are not in full activity until after birth: I mean the sensations of light and of sound. Many psychological and pathological facts show that the action of external light is not indispensable in order that the cerebral centre and even the immediate organ of sight should receive luminous impressions." Cabanis consents to conclude on this point, however, that the foetus can have no idea of the light of day, nor of colours. As to hearing, he claims that "the foetus may have received impressions of sound, that it may at least have heard confused noises, and that it is difficult to conceive that these impressions are not frequently renewed during the time of gestation." We are sorry not to agree with this opinion,

If the newborn child is deaf—and he certainly is in the first hours of life—how can it be seriously held that he has perceived sonorous vibrations when the causes of obstruction were greater and the conditions of penetration less favourable? The uniformity of the medium—every sensation presupposing a diversity of impressions, a “differentiation,” as they say to-day—prevents also the possibility of the child’s having gustatory and olfactory sensations, washed on all sides as he is by the liquid that surrounds him. There remains, then, no possibility of sensations other than those of the tactile and cutaneous sensibility; and still how limited! for the reason just indicated—that is to say, the uninterrupted continuity, the uniform and therefore insensible action of the same surrounding medium.

Moreover, what can these rare tactile sensations be? In the first place, they are never produced until the hundredth day. Luys says: “We can see from the fourth month that the nervous system begins to react, and to reveal the vitality of the different phenomena which compose it. We know, indeed, that from this time on the foetus is sensible to the action of cold, that its *spontaneous* motions can be developed by laying a cold hand upon the body of the mother; we

but we think, not only, as Cabanis finally acknowledges, that “the education of the ear is not yet very far advanced,” but that it has not begun at all. It is interesting to find that the realist Cabanis and the idealist Malebranche agree in their conclusions: the one imagines a soul perfect and complete, the other a brain fully organized before birth.

know, too, that it makes spontaneous motions to shield itself from a pressure that disturbs it and brings its sensibility into play.”* There seems to us to be some inaccuracy, in expression at least, in the passage just cited; the motions that Luys speaks of could not be called “spontaneous,” since they are caused by a disturbing contact or by a sudden impression of cold. Their existence is not to be doubted, but they are purely reflex, analogous to those produced in a baby when we tickle his foot with a feather. Besides these reflex motions there are also muscular contractions, doubtless, even in the fœtus, which are spontaneous, the first flutterings of the being that lives and is beginning to move.† These motions usually become perceptible to the mother between the seventh and the ninth month of gestation. So that there have already appeared before birth, in a very rudimentary form, the two essential operations of all mental evolution: on one side, the excitation from without producing a reaction of the interior force; on the other, the spontaneity, the inner vitality showing a tendency to act for itself.

These movements, whether reflex or spontaneous, presuppose at least a rudimentary organi-

* Luys, *Le Cerveau et ses fonctions*, Paris, 1876, p. 100.

† “If the child kicks during the last part of gestation, if he moves uneasily, more impetuously and more continually as well as with more force, it is not because he finds himself hemmed in and is uncomfortable, but his limbs have acquired a certain degree of strength, and he feels the need of exercising them.” (Cabanis, *Rapports du physique et du moral de l’homme*.)

zation of the nervous and of the muscular system, together with the exercise of these phenomena proportionate to their development. But the question is one of determining whether these phenomena are plunged absolutely in the darkness of the unconscious, remaining exclusively material, or whether, on the contrary, they already have a right side and a wrong side, the two aspects, one material, the other spiritual, of all psychic facts; finally, whether a flash of consciousness accompanies them and lights them up enough to produce infinitesimal sensations of pain or of pleasure. We incline toward the second hypothesis—although it is impossible to establish its reality—at least for the last months of gestation, when the motions are so frequent that the almost continuous shock excites at least a faint fluttering of consciousness. Persuaded—and it is impossible not to be—that consciousness permits of many degrees, that it resembles day succeeding night, after all the shades of dawn and early morning have passed away, we see no difficulty in admitting *a priori* that the first stakes of this slow evolution are set before birth.* What tends to confirm this supposition is that the child shows himself prepared for pleasure and for pain as soon as he appears. We are permitted to conjecture and infer what

* This is the opinion of most psychologists. However, let us note a statement to the contrary. "In the last months of gestation the human foetus is susceptible only to motility; it moves, reacts under a shock, but unconsciously." (Létourneau, *la Sociologie*, Paris, 1880, p. 526.)

has gone on behind the scenes as soon as the curtain is raised, from the actions and gestures of the actor before us. Now, the cries of the child could not be interpreted as absolutely mechanical and unconscious acts. The cries, his first salute to life, which express suffering, or at the least a disagreeable impression produced by the surprise of a new medium, and which certain philosophers have translated thus, "I suffer, therefore I exist"—these cries are evidence at least of a beginning of sensibility, which must have been prepared and exercised to a certain extent in the intra-uterine life.

But however indulgent we may be in our judgments, and while granting even extreme favour to the conjectures on the state of the embryo, it seems impossible to grant that it is anything more than a muscular automatism, whose commotions are felt more or less in the nervous system; nothing in any case that resembles intelligence, clear and distinct perception.* Nature, doubtless, has not remained inactive. She has made and adjusted the instruments. All the essential parts of the machine are in their place ready for work. The different organs of the nervous system, and of the brain itself, have already attained an advanced degree of development. And still everything remains to be done that shall cause the intellectual and moral

* Nothing, above all, that resembles the consciousness of self, which Cabanis attributes to the foetus, under the pretext that it has already received the first impressions of which the idea of resistance and the idea of strange bodies are composed.

germs transmitted by heredity to pass from a state of passive power to one of action.

Is it true, moreover, as the author of *L'Éducation antérieure* claims, that these germs are transmitted to the embryo in part by a mysterious communication proceeding from the brain of the mother? De Frarière, with his complacent imagination, magnifies a few insignificant facts, attributes to them an import which they do not possess, and concludes that he has discovered a new idea whose development, so he says, will warrant anticipations of the most happy consequences for the future of humanity.* Indeed, if it depended upon the mother to fashion in her image, by the thoughts and feelings with which she occupies her own mind, the little being which she carries, we should have almost discovered the secret of making artists at will, and from a moral point of view of making good men. It is upon the communication of musical impressions that De Frarière particularly insists. To explain the wonderful talent of such and such a musician of genius, it would be enough to remember that his mother performed or heard a great deal of music during her gestation.† But this is not all; the influence of impressions received while in the mother's womb would extend to all the child's faculties.

We shall first observe that De Frarière's theory, which he believes to be new, is but the republication of the reveries of Malebranche, who

* De Frarière, *L'Éducation antérieure*, p. 1. † *Ibid.*, p. 69.

also imagined, as we have already said, that the brain of the mother modelled in its own likeness, physically and morally, the brain and body of the child. The author of the *Recherche de la Vérité* even recounted improbable tales on this subject, for instance, the story of a mother who looked too attentively at the head of St. Peter, and, in consequence, was delivered of a child whose face was that of an old man.* But the fact of its not being new does not make the fancy of anterior education any the more trustworthy. The moral and physical health of the mother does assuredly exercise an indirect effect upon the embryo; and that is why physicians multiply their prescriptions in recommending to young mothers all sorts of precautions in their physical and moral *régime*. A material imprudence, an excess of any kind, as well as a moral commotion, a nervous crisis, may cost the life of the child by causing a premature birth, or may inflict upon it an organic deformity or a constitutional malady that will never be outgrown. But no one thinks of claiming that a feeling of sweet content, a calm and serenity of mind which are the conditions of happy gestation, can transmit the same dispositions directly to the child.†

It is not in a mysterious exchange performed

* *Recherche de la Vérité*, Book III, chap. vii.

† Cabanis, however, accepted this strange hypothesis. See the passage in *Rapports du physique et du moral* (dixième mémoire) beginning thus: "I shall not speak of the sympathetic affections generated in the fœtus by the close relations with the mother," etc.

during the double life of a pregnant mother, nor is it, in spite of the popular expression, by sucking the mother's milk, that the child acquires the tastes, the hidden inclinations, the instinctive tendencies that sleep in the embryo and awaken but slowly in the newborn child. It is generation, not less mysterious, it is true, that, together with life, causes the universal qualities of humanity with certain peculiarities of race and of family to appear in the being begotten and conceived. Montaigne knew that generation transmits to us not only the bodily form, but the cast of mind and the inclinations of our fathers.* If there is one fact established to-day, although it may be inexplicable, it is that, thanks to heredity, mental and physical traits pass from ancestor to descendant.

But, to be sure, nothing in the uterine life betrays the existence of hereditary dispositions; it is only after birth that these germs can open themselves out. It was in vain that Cabanis said that the fœtus, before seeing the light of day, has already received many different impressions, from which have resulted long series of volitions; that it has contracted habits, that it feels appetites and has inclinations.† The appetites and inclinations are not shown until the

* Montaigne, *Essais*, Book II, chap. xxxvii. Montaigne reminds us that, according to Aristotle, among certain tribes of antiquity, in which the institution of marriage did not exist, children were assigned to their fathers by resemblance.

† Cabanis, *Rapports du physique et du moral*, dixième mémoire.

child is born ; they exist by Nature, not by reason of anterior impressions. The habits reduce themselves to dispositions in the management of the limbs, and they result from the position in which the child's body was placed ; he will keep his legs in a more or less bent position, in the form of a sabre, and when he is put into a bath will try to bring the soles of his feet together. As to the "long series of volitions," that is a mere fancy, and what Cabanis ambitiously calls the "ideological state" of the fœtus is equivalent, so to speak, to zero. The child just born is *tabula rasa*, not only in regard to the external world, which he has not yet perceived, but relatively to anterior impressions, which, supposing that they may have existed, and that they may have called forth a vague beginning of consciousness, have at least left no trace behind them, no remembrance, and have passed away as shadows.

II.

Infant psychology begins only with birth. From this time on the work of adaptation, of accommodation of the little human being to the medium in which he is called to live, will proceed slowly. The nervous system, as far as it is formed at this time, and in the proportion that it will develop further, will respond to the incessant excitations of external objects. The brain, which gains every day in consistency, physically speaking, will become little by little the regulator of the child's actions and the seat of con-

sciousness.* Instincts will be exercised from the beginning, preparing imperceptibly, for the appearance of the conscious life. Sensations will succeed sensations, growing clearer and more defined, determining by their repeated impressions an internal sense, so to speak, an individual consciousness; an intermittent consciousness at first, which is formed and dissolved, which makes and unmakes itself continually, with the alternation of sleeping and of waking, and which can hardly be completely formed as long as sleep absorbs the greater part of infantine existence. In a word, the psychological woof is going to weave itself thread by thread, slowly, it seems, if we follow the daily acquisitions step by step, but with marvellous facility when we consider the nothingness of the starting point.

It must not be forgotten that the starting

* See Parrot's observations, "Sur le développement du cerveau chez les enfants du premier âge," in the *Archives de physiologie normale et pathologique*, 1879, Nos. 5 and 6. The result of his research is that the brain, soft, semitransparent, friable, very aqueous, of an almost uniform tint and homogeneous appearance at first, is condensed little by little, becomes more solid, and two colourations appear. From month to month the progress becomes more marked. One fact important to notice is that the development of the right side appears before that of the left side. And in this connection Parrot calls to mind the fact that the right hand is controlled by the left hemisphere, that the organ of articulate language has its seat in the left hemisphere. "But," he says, "it must be remarked that the predominance of the right hand, as well as the power of speaking, does not manifest itself until some time after birth—that is to say, after a long period of improvement."

point of the mental development of the child is almost at zero. Just as we do not accept the illusions of poets and of mothers—maternal love is the most deceiving of poets—who would see a marvel of beauty in the newborn babe, in this little, red, wrinkled, squinting thing, as Gustave Droz says,* so we shall not invest the poor little creature with sensations and emotions of which its moral destitution will not permit. “At the same time that he leaves darkness and sees light for the first time,” said Malebranche,† the “coldness of the outside air strikes upon him; the most caressing touch of the woman that receives him hurts his delicate organism; all exterior objects surprise him; they are all objects of fear to him, because he does not know them yet, and because he has no means of defence or of flight. The tears and cries with which he consoles himself are infallible signs of his troubles and of his terrors, for they are the prayers which Nature offers for him, asking those who care for him to defend him from the ills that he suffers and from those he fears.” This is undoubtedly a tempting conception, which poetizes the first days of life by imagining a child capable of feeling astonishment, fright, and pain. How dramatic the entrance upon existence would be if the newcomer should see the world opening out before him for the first time with the eyes of an intelligent and sensible spectator! But for these emotions,

* Gustave Droz, *L'Enfant*, Paris, 1885, p. 26.

† Malebranche, *Recherche de la vérité*, Book II, chap. viii.

whether terrifying or soothing, to be possible, it would be necessary for the newborn child to be considered as being somebody; and the trouble is, that as yet nobody is there. It is Nature, it is not yet the individual, that manifests itself in the first motions and the first cries of the child. His senses, with the exception of touch, do not enter immediately into activity. He is deaf, he is blind; he is mute also in spite of his cries, for he is mute who can not put significance into the sounds he makes. His movements are purely reflex, totally lacking in conscious intention, determined, at the most, by a mechanical instinct. Let us give up looking for a little man where there is still only an automaton.

Although the child has left his mother's womb, and will henceforth live an independent life, still there is as yet nothing of the individual or personal. The first days help us only in the development of hereditary germs, and do not show us anything that resembles a distinct mental physiognomy. We may say of the child what natural scientists say of the animal: "The psychic activity of the animal has nothing personal in it; it is transmitted without change of form from generation to generation; here we have hereditary instinct and nothing more. But as soon as consciousness develops intelligence appears; it grows with the consciousness; a personal psychic activity is combined at every step with the hereditary activity; intelligence is brought to bear upon the instinct, modifies it, and transforms it in a thousand ways; the original canvas is cov-

ered with embellishments.”* “The original canvas” in the case of the child reduces itself to a few instincts, whose evolution consists of constant reappearance under the same forms. Just as medals come forth from a crucible, one by one, bearing the same impression and the same effigy, so the successive generations of humanity repeat the same rôle from age to age, or, so to speak, spell the same alphabet in their beginnings of life. If it is true, as anatomists declare, that the embryos of the most diverse animal species, including the human species, have a very marked trace of family ties, not very flattering to our vanity, it is not less certain that all newborn creatures resemble each other, trait for trait, in their instinctive actions. Innéité (innéité, innateness or inborn nature)—I mean the personal nature with its original characteristics—inneity, this first antagonist of heredity (education will be the second), does not show itself yet. It is the impetus of heredity, it is the life of the species that triumphs, not having met, as yet, whether in the circumstances of a special medium or in the appearance of particular inclinations, in the development of what physicians call the *idiosyncrasy*, the conflicting forces that will modify it later. We can not conceal the fact that if the life of the newborn child is at first exclusively instinctive and automatic, it is because there is not as yet a centre of action and of direc-

* Edmond Perrier, in the preface, upon mental evolution in the French translation of Romanes' book, *Animal Intelligence*.

tion organized in the brain. The activity of the child will show itself at first in local operations, so to speak, responding to the needs or the sensibility of each organ in itself; not co-ordinate movements of the limbs, but set movements, determined by the instinct of nutrition, first impressions of the senses. The newborn child is really, as Virchow defined it, "a purely spinal being"; and there is some point in the comparison that has been made between the newborn child and a decapitated animal.

One proof that intelligence proper, even in the lowest forms, is still lacking, is the significant fact that children destined by Nature to be idiots appear the same in the beginning as those that afterward become intelligent.

For instance, this is how Espinas describes a child studied from the first minute of his existence: * "March 12, normal birth, male sex, normal constitution, medium weight. From the first day a certain number of definite motions referring to the function of nutrition. Buccal prehension of the finger when presented to him. In yawning, bends the head toward the breast of the person holding him, trying, doubtless, to nurse. Motions of the arms not co-ordinate; strikes his face with his fingers."

Let us place by the side of this portrait of a normal child, predestined to acquire all his faculties regularly, an observation made by Bourne-

* M. A. Espinas, *Observations sur un nouveau-né* in the *Annales de la Faculté des lettres de Bordeaux*, 1883, p. 383.

ville on a little girl doomed to idiocy: "Birth one month late. During the first six months the child was like other children. From that time her motions diminished almost to the point of immobility of the limbs. The physiognomy, which expressed the vivacity and other characteristics common to children of that age, changed. She took on an air of imbecility, which she still keeps." *

So, in the animal life of the first days, as well as in the vegetative life of the uterus, nothing as yet betrays the future man; and it is not always possible to tell in advance whether one has to do with normal or abnormal children.†

The instinctive life of the little child, moreover, has characteristics of its own which should be noted. The human instinct does not seem to be endowed in the same degree as is the animal instinct with that spontaneity, that infallibility, which distinguishes the movements and actions of little animals, and as a result of which the establishment of instinctive operations becomes in the twinkling of an eye an accomplished fact. In man, even in the case of the instincts, there

* Dr. Bourneville, *Association française pour l'avancement des sciences*, 1889, second part, p. 821. The minute and precise observations which Dr. Bourneville has made for fifteen years, at the Salpêtrière and at Bicêtre, on idiotic children will be found very useful and profitable in the study of the questions with which we are concerned.

† We must state, however, that this is the exception, and that more often the idiot gives evidence of his misfortune from the very beginning.

are, so to speak, preparations, gradations, and periods. "If we examine different animals at the time of their birth," said Bichat, "we shall see that special instincts in each one of them direct the execution of particular motions. Young quadrupeds go to their mothers for nourishment; birds of the gallinaceous order lose no time in seizing the grain which is their appointed food; while the young carnivorous birds only open their beaks to receive the nourishment brought to the nest by the parent birds. The development of instinct in the child is much slower. Nurses know well from experience that it is necessary to take all sorts of precautions and care in inducing nurslings to take the breast, to place them in a particular position, which they are incapable of finding for themselves; a sort of apprenticeship, veritable tactics are necessary. "In the human race the newborn is passive; the activity is all on the mother's side."*

What a difference there is between the little animal which walks as soon as it is born, knows how to find its mother, to run after its food, and to get itself out of trouble, and the poor little human being who can not do anything by himself, and would surely perish if his parents did not come to his aid! "The young bird or mammifer comes into the world with a quantity and a precision of ancestral knowledge that is truly astonishing. Little chickens, from the very first day, follow the motions of insects with their eyes,

* Dictionnaire de médecine, Dr. Jaccoud, article Allaitement.

turning their heads with as much precision as a grown fowl. They pick up crumbs or insects, showing that they have instinctive perception of distances, and also the faculty of measuring them with almost infallible exactness. They do not try to touch objects out of their reach, as children do when they stretch out their arms to the moon, and we may say that they always reach any object aimed at; they never miss it by more than a hair's breadth, even when the point in view is no larger and no more visible than the dot of an *i*." * And observations of the same sort show us as much instinctive precocity in the young of mammals, without its being possible to explain, either by a rapid education or by an unconscious imitation, the perfection of their activity.†

A very different sight is presented by the weakness of the child, who can not hold his head erect nor control his limbs for prehension or for walking; who can not perceive objects, and still less appreciate distances. An appeal to the principle that the more elevated the functions of a being, the longer and more painful his evolution, will not suffice to explain this state of inferiority; it will not apply here, except in the case of functions common to animals and men. No, the real reason is that the child at the moment of birth has not attained the same degree of ma-

* Romanes, *Mental Evolution in Animals*.

† See, for example, Charlton Bastian, *Le cerveau organe de la pensée*, vol. i, p. 177.

turity and advancement in his organism that the young of animals have reached.

Instinct is a natural tendency to perform certain actions, a *nisus*, a spontaneous *stimulus*, but appropriate instruments are necessary to its exercise; it presupposes a certain development of physical parts, and particularly of the nervous system. Hence the tardy appearance even in the animal species of certain instincts—for instance, of the faculty of flying, which naturally will not show itself until the young birds have feathers. Hence, also, the hesitations, the gropings of instinct in the child. Suppose, for a moment, that the newborn child were far enough advanced in point of nervous excitability and muscular force to hold his head erect, and, above all, to control and direct his legs and to walk; and you would see him run to his wet-nurse with the same impetuosity that young mammals run to their mothers for nourishment.* One fact, among others, that shows well the relations between the exercise of instinct and the degree of strength of the organs, is that a child born too soon is incapable of grasping its mother's nipple.†

At what moment does consciousness begin in this pitiable creature, whose activity is so restrained? The problem, stated in this absolute form, can not be solved.‡ There can be no ques-

* "Who knows but that, in ages to come, children may be born able to walk alone?" (Dauriac, *L'Âme du nouveau-né*, dans la critique philosophique, 1886, vol. ii, p. 356.)

† Dictionnaire de médecine, Dr. Jaccoud, article *Allaitement*.

‡ This is a question of the same sort as that which has occu-

tion of consciousness, properly speaking, in the beginnings of life—that is to say, of this feeling of the self, which permits us to judge of our existence. It may be said of the child as of the animal :

“ Vivit et est vitæ nescius ipse suæ.”

But if there is not yet consciousness of the self, there certainly are impressions from the very first day which are vaguely felt, and, in

pied theologians and scholastics for so long : “ When and how is the soul introduced into the human body ? ” Two contrary opinions on this point have successively prevailed : One, *traducianism* or *generationism*, admits that the soul is transmitted from father to son. This is the opinion of Tertullian, of Saint Jerome, and of the majority of the early doctors of the Church. Luther adopted this view, and Leibnitz seems to have accepted it also. “ I am inclined to believe that the souls that will one day be human souls have existed in the seed in the ancestors back to Adam.” (Essais de théodicée, first part, section 91.) Leibnitz added that these souls, purely sensitive or animal, do not become reasonable until the moment of the generation of the individuals to whom they are to belong. The other opinion has become the official doctrine of theologians ; it is *creationism*, according to which all souls are created directly by God. “ The formula by means of which the schools of theology define it is very simple : God creates souls, and infuses them into the body while it is in the mother’s womb, when the body is ready for animation.” (Jean Reynaud, Terre et ciel, p. 154.) Saint Thomas wrote : “ Hereticum est dicere quod anima intellectiva traducatur cum semine.” These are the different objections which this theory of the infusion of souls into the body raises, the time of the infusion not being determined, and hence left vague—objections which are turned to account by the Neoplatonists, like Jean Reynaud, in order to justify their dreams on the pre-existence of the soul, on their migration from planet to planet, from body to body.

consequence, conscious of themselves.* If we were asked what is the first act of consciousness so understood, we should not hesitate to reply that it is an act of suffering, of physical pain. "The child feels himself suffer," says Dauriac, "therefore he knows that he suffers." The conclusion is false, and not warranted by the premise; but the premise is true, if understood to mean simply that there are little sensations of pain which are felt immediately, if they are only those resulting from shocks to the sense of touch, the only sense that enters into activity at once.

There is no doubt but that in the first weeks of life the painful sensations overbalance the pleasurable ones; and if a decisive proof of this were desired, it could be drawn from the fact that the mortality of newborn children is notably higher than the average mortality. How many children succumb almost immediately in the struggle between their frail organisms and Nature! For how many are the first and last breath separated by only a few months or a few days! The proportion of mortality during the first year is a quarter of the children born. From one to six years, it is still fifteen or sixteen per cent; in the period of six to fourteen it falls to two or three per cent.† I know that the ignorance and

* It is the result of an effort to give an account of the many different phenomena commonly understood in the word "consciousness" that certain writers have risked the barbarism "consciosity," which would be to consciousness what velleity is to will.

† Dr. D'Ammon, *Livre d'or de la jeune femme*, p. 242.

carelessness of parents are in great part responsible for this evil. We must blame clumsy rearing rather than an improvident Nature for the fact that children are called into existence only to be immediately given up to death. But, nevertheless, it is true that the act of beginning life, and the work of accommodation to external circumstances constitute in themselves a period of crisis, when the assaults of disease are particularly numerous and formidable. "How many doors there are open to functional disorders, and what a morbid opportunity, so to speak!" writes a physician.* The most delicate, the least cared for, die from attacks of physical sickness; but all, even the most healthy, the best cared for, are affected by it; all have to suffer more or less in their first attempts to use their organs, from heat or from cold, from difficulties of alimentation, from the harshness of the medium, finally, from the adaptation of their nerves and muscles to the conditions of life.

So it is a picture of the child's sufferings that most observers have been pleased to give us. From Pliny or Lucretius, down to our own times, it has been repeated:

"Then the poor babe, too, like a seaman wrecked,
Thrown from the waves, lies naked o'er the ground,
Weakly, and void of every vital aid,
When Nature first, amid his mother's pangs,
Casts the young burden on the realms of light,

* Dr. Lorain, article *Agès*, in Dr. Jaccoud's *Dictionnaire de médecine*.

And leaves to pine full sore, as well he may,
That e'er the suffering lot of life were his."*

Modern writers also have preferred to consider the painful side of the life of the newborn child. Mme. Necker de Saussure says: "Pain introduced man to the world. A throng of tumultuous sensations assail the soul at its first appearance. The air forces its entrance into the child's lungs like a rapid torrent and irritates them. The light dazzles his eyes through the transparent veils that cover them. Suffering, amazement, dizziness—this is what comes to the soul at the mysterious moment when it is plunged into the whirlpool of life."

There is some exaggeration in these sombre pictures, as well as the pessimism of prejudice.† To say nothing of the pleasures which compensate in a measure for the child's suffering in the first stages of his life, it is not well to take the suffering itself too tragically. It is moderate and vague, and the state of semiconsciousness, of semisensibility, in which the child is still plunged, if it denies him clear perceptions and definite pleasures, also shields him from too acute

* Lucretius, *De Natura Rerum*, J. M. Good's translation, Book V.

† The general opinion seems to be that the child suffers without compensation: "The newborn child, at the moment of birth, is manifestly susceptible to painful impressions" (Letourneau, *La Sociologie*, p. 526), and the author does not tell us that there is any manifestation of agreeable impressions. "The newborn child seems to me to express, by all his attitudes, 'the fear of living'" (Dauriac).

suffering. We must not believe his cries; the sign of expression in the child is always disproportionate to the thing signified. The first impressions made on the child's sensibility have not the brutal harshness which people pretend. It is by gradual transitions and with infinite caution that Nature conducts the blind and deaf just born to the full possession of sight and of hearing. And if it pleases poets to represent to us, in their conventional fictions, a blind and wicked power willing to cast a naked child upon a bare earth, reality shows us, on the contrary, a far-seeing Nature, everywhere present and active, which has prepared for the child's rest and nourishment in the soft pillow of the mother's breast, with its comforting warmth and its gentle touch.

"During the first months of life," says Dr. Sikorski, "the positive or agreeable feelings, resulting in contentment and good humour, are maintained by a great number of sensations; the action of sucking, the tepid bath, a warm bed, a soft light, sweet sounds, a moderate muscular activity. Being given these enjoyments in profusion, the child offers, ordinarily, the aspect of serenity; he is quiet, patient, cheerful; he makes many motions; his face wears an agreeable expression, his eyes are opened wide, his cheeks are chubby."* It would be hard to see in this picture the image of a suffering and unhappy being condemned by Nature to a life of pain.

* *Revue philosophique*, vol. xix, p. 244. Le developpement psychique de l'enfant.

But we can not push these preliminary studies further without encroaching upon the detailed analysis which we shall devote, in the course of this work, to each one of the forms of mental activity. Let us confine ourselves to recalling the fact that the child at birth has only the appearance of a completed being. Even from the physical point of view he is still only a sketch, a rough outline. "His muscles, his nerves, his organs, are made of milk, so to speak." His limbs not merely have to grow; even consistency and solidity are lacking in them. With his tiny stature, so light in weight, he is still but the epitome of a man, an abridgment, whose lines are merely sketched and vaguely drawn. The remarkable part of it, moreover, is that there will be a correspondence between his physical growth and his intellectual evolution. The dwarfishness of idiots has often been proved. A mother, whose daughter had shown evident signs of intellectual atrophy from the time she was five or six months old, said, "From this time on the child never grew." But what is lacking, above all, in the newborn child is what depends upon the mental faculties. Truly, his soul is not yet born;* it will separate itself, little by little, from the repeated shock of sensible impressions, from the play of actions and reactions caused by the con-

* To be sure, we do not take the word "soul" in its metaphysical sense as a synonym of an immaterial principle. In these studies of pure observation we have nothing to do with questions of substance and of essence. The soul, for us, is simply the *ensemble* of the intellectual and moral phenomena.

stant relation of the excitations of the external world, and of a nervous organism more and more developed as time goes on. Nature is contented with organizing what is absolutely indispensable to a minimum of material life, and this even on one condition, namely, that parents shall lend their aid to the work. All the rest is the free field of experience ; the perceptions, emotions, ideas, choices—in a word, the conscious acts as a whole, will result from daily acquisitions and a slow evolution.

CHAPTER II.

MOVEMENTS THE FIRST FORMS OF ACTIVITY.

I. Movements the first manifestations of life.—Initial period one of torpor.—Extreme motor activity of the child.—The vivacity and regularity of motions correspond in a certain degree to intellectual dispositions.—Counter-proof in the observations made on idiots.—Psychological value of movements.—Classification of movements. II. There are not only reflex movements in the child.—Spontaneous movements, which reveal the inner energy.—Automatic and instinctive movements.—Character of automatic movements; they are without purpose; they are not co-ordinate.—These movements do not disappear with childhood.—Purely reflex movements; more complicated than automatic movements.—Why is reflex action limited and sluggish in the beginning?—Sneezing a type of reflex action.—Other reflex actions.—On what part of the nervous system do they depend? III. Instinctive motions.—Two extremes; of those who see instinct in everything, and of those who do not recognise it at all.—The action of sucking a type of instinctive movement.—Instinct precedes all external excitation.—Remarkable precision of the first movements of sucking.—Rapid modification of instincts.—Consciousness and desire.—The evolution of the motor phenomena precedes the evolution of conscious representations. IV. Other movements of the child.—Cries.—Different interpretations of cries.—Partly spontaneous, partly reflex.—At first they have no moral significance.—The prehension of objects.

I.

MOVEMENT is one of the first manifestations of life in the child—the first, indeed, to speak

exactly, the primary mode of activity—for the cries, sneezing, tears, are movements also. The internal force which later will be sensation, reflection, thought, does not betray itself in the beginning, except in little muscular tensions. Everything in the child's consciousness is still asleep, and already the activity of the living being reveals itself in an extraordinary profusion of motions—in a multitude of grimaces, contortions, gestures of every sort; later, when the child can walk, in leaps and gambols. There is, doubtless, a first period, when it seems as though the deep sleep of the intra-uterine life were prolonged in a sort of habitual torpor and of endless drowsiness.*

The child is dull and almost inert. But the time soon comes when, according to the popular expression, he does nothing but kick. One sees not only determined and useful movements, such as the motion of the lips in sucking, and that of the eyelids in protecting the eyes from too strong a light, but a great number of immoderate and irregular motions. When he is not asleep, when

* According to Preyer's observations, the child sleeps sixteen hours a day during the first month, fourteen hours during the third month. The difference between the sleep of the intra-uterine life and that of the newborn child results principally, as Dr. Sikorski states, from the fact that in the former the apparatus of the organs of the senses are sheltered from all external excitation, while in the newborn child sleep comes from the fatigue which the sensitive organs in their state of weakness feel very soon. The work of the muscles of respiration, work which does not exist in the foetal life, seems to be one of the greatest sources of the fatigue felt by the child.

he is neither tired nor ill, the child a few months old is all motion; his arms and his hands, his legs and his feet, his eyes, lips, head, the whole body—everything in motion.*

Rabelais is wrong when he says that the child divides his existence between eating, drinking, and sleeping; he forgets at least one of his essential occupations, that which consists in motion—motion sometimes without purpose and by a sort of automatic play of the muscles, sometimes for a definite end, conforming to his needs.

This extreme motor activity, which is the characteristic of childhood, will not end, moreover, with the awakening and the progress of intelligence. Even when the child is capable of governing his attention motion remains as the necessary accompaniment of his little intellectual efforts. A little girl consented to take her reading lesson on one condition, namely, that she should be permitted to have her fingers occupied at the same time, and that she might draw her needle in and out while saying the letters of the alphabet.† And when the movements are not voluntary, concerted, as in the preceding example, there are incoherent, irregular motions

* "When my little girl was about three months and a half old she was placed on a rug in the open air in the garden, where she would lie on her stomach or on her back for an hour at a time, moving her arms and legs." (Taine, *Revue philosophique*, vol. i, p. 5.)

† "When children learn to write," says Darwin, "they often twist their tongues about in the most laughable fashion while following the motions of their fingers."

which, so to speak, accompany and aid the beginnings of attention. Go into a kindergarten—not during recreation time, when all the children are skipping about, but when the teacher is giving a lesson—see how this little world is going on, how it flutters, how it recovers from the relative immobility that has been imposed upon it while seated, by all sorts of forbidden movements; glances are directed now to the right, now to the left; lips pucker; fingers contract or extend; heads swing from side to side.

The study of movement, then, constitutes one of the important chapters of the psychology of the child. And this study, interesting in itself, will offer more attractions still when we consider that there is a close connection between the particular evolution of the motor faculty and the development of all the intellectual and moral faculties at the child's disposal. As a rule, the vivacity and the regularity of the motions of the newborn child are not only a sign of present physical health, they are a token of future intellectual activity. The motions of the normal child present this double characteristic, that they are very numerous, very varied, and also that by the spontaneous development of a sound nature, not less than by the action of education, they pass quickly enough from the disorder and chaos of the first days to a state of progressive co-ordination. In the idiotic child, on the contrary, observers notice either inactivity, obstinate immovability, or an absolute lack of co-ordination in movements that are as irregular as they are

abundant. The poor little creature who will never manifest any intelligence or any will shows the weakness and defects of his nature from the first years, either by the scarcity or by the confused excess of his motions; either he does not stir, is sickly and dull, seated on a chair or lying on his bed, or—and this is ordinarily the case—he gives himself up to a veritable drunkenness of motion; he moves without truce or rest.* The different parts of the machine, deprived of the regulator, fly about in every direction.

Motions, then, possess a real psychological value; but, apart from their importance, they have this advantage over all the other phenomena of the child's life, that they are apparent, that they come directly under the grasp of observation. While waiting for the child to learn to speak, they are, as Marion says, "the only possible signs of what is going on within him."† There is interest, then, in studying them at the beginning, since it is through the movements that we are able to reach the phenomena of the inner life, and particularly of the first emotions. These are the only actions of the child that teach us what he is.

* See on this point Dr. Sollier's *Psychologie de l'idiot et de l'imbécile*, Paris, Alcan, 1891, p. 87; also Romanes's *Mental Evolution in Animals* (p. 178). "One fact," he says, "that must strike any one visiting an asylum for idiots is the extraordinary character and variety of the useless and thoughtless movements one sees all about one."

† *Revue scientifique*, vol. xvi, p. 769 *et seq.*, Marion's article, *Les mouvements de l'enfant*.

Moreover, we are not to occupy ourselves primarily with the material mechanism of the movements. It is the business of the anatomist or of the physiologist to describe the organs or to explain the functions of the motor faculty. What comes within our domain, on the contrary, is the search for the hidden origins, the principles of motion—principles sometimes obscure, in any case diverse, but whose very diversity permits phenomena, uniform in appearance, to be classed in a certain number of distinct categories.* Motions in themselves, indeed, are never more than a nervous excitation followed by a muscular contraction, but they differ greatly as to their causes.

In the psychology of the fully developed man the work of classifying the motions seems simple enough; we are contented, in general, with distinguishing two great classes: the voluntary movements and those that are not voluntary, these last arising in almost all cases from habit.

In the case of the child there can be no doubt but that the movements, in their first appearance,

* Hartley, who was the first to attempt a classification of motions from the point of view of the mental state preceding them, distinguished only two kinds of movements, automatic and voluntary—the first depending on sensations, the second on ideas. Hartley did not recognise automatic movements, that are owing to impressions not felt. Sensation is not the necessary antecedent of every involuntary motion. And, on the other hand, automatic movements may have much more than a sensation as their condition—an idea, for instance, in the laugh called forth by a comical idea.

are all involuntary : no idea, no intellectual representation, no choice concurs in producing them. But under this common characteristic the diversities of origin appear. There are different forms of the involuntary as there are different forms of the unconscious. Among the motions of the child, some are owing to an excitation from without, to an impression, we dare not say to a sensation ; we shall call these reflex motions.* The others give evidence, on the contrary, of an innate vitality, an inner impetus ; these are spontaneous motions. But these spontaneous movements in their turn are of different kinds : on the one hand they are undetermined, without purpose, depending only on an automatic activity ; others, on the contrary, are very definite, very co-ordinate, show deep instincts, needs that demand satisfaction and find immediate means of obtaining it ; whence two other categories, that of purely automatic motions and that of instinctive movements.

It is these primary classes of motion that

* We limit intentionally the sense of the word "reflex." The reflex actions, according to Bain, are characterized by the absence of the distinguishing feature of the voluntary actions—namely, the stimulus of a controlling sentiment. In this sense every involuntary action would be reflex. Littré defines reflex action in the same way when he says that it is that which, independently of the will, succeeds either sensations or unconscious phenomena of the sensibility. We wish, in the interest of clearness, to limit still further the sense of the word reflex. We shall employ it to designate only the movements that are, as it were, responses of the organism to an excitation produced at the periphery, and resulting from an external cause.

should be studied in the beginning; the study of voluntary movements * should be delayed, since it is necessary but to define their conditions to understand that they can not be found in the beginnings of the child's life. The voluntary movements, indeed, correspond to a much more advanced period of psychic evolution, since they presuppose in very different degrees the intellectual representation of the end to be attained, as well as that of the action suited to this end. Preyer determined the perfect type of voluntary movement with rigorous precision when he brought down its essential conditions to four: first, an idea which precedes it and its cause; second, the preliminary knowledge of the movement to be accomplished; third, a definite end; fourth, the faculty of being arrested, "inhibited," by other ideas at the moment when it is about to be accomplished.†

II.

There is a natural temptation to believe that all the movements of the newborn child are purely and simply of reflex origin; that they are always provoked by a peripheric excitation; that the little child, in a word, does not move of his own accord, but that he is moved, so to speak, by external causes. This theory may flatter the presumptions of the opponents of *innéité*, *innateness*

* See Chapter XII.

† Preyer, *The Senses and the Will*, p. 192.

or inbornness, but it is contradicted by the facts. There is, undoubtedly, something of the spontaneous in the motor activity of the suckling. Its acts often depend upon internal causes, and the inneity of movements is, as it were, the prelude to the inneity of emotions. Here, as everywhere, outward influences must be considered, but the greatest weight must assuredly be placed upon the action from within. We should be able to account for only a very small part of the child's motor faculty if we considered only purely reflex motions. The excitation of light, for instance, which, when too bright, wounds the delicacy of the eye, may be sufficient to explain the fact that the eyelids close, but it does not explain why the eyelids open, why the muscles of the eye, when the organ has acquired strength enough, raise, of their own accord, the curtain that has hidden from the child the light and the sight of things about him.

This innate activity, this natural tendency to motion, shows itself, above all, before we come to voluntary motions, in the definite, regulated motions that may be considered instinctive motions—the act of sucking, for instance; but it shows itself also, and that from the first day, in a number of motions which, though not regular nor determined enough to be attributed to veritable instincts, are at the same time too spontaneous to be classed with purely reflex actions, and which testify already, in their way, to the inner energy. These are the movements which Bain calls “spon-

taneous," * Preyer "impulsive," † and which, with Marion, we shall call "automatic."

The characteristic of automatic movements is that they forestall all sensation; that in every case they are produced without sensations; that they do not presuppose in any way a previous excitation of the nerves of sight or of the other organs of the senses; that they arise wholly from the depths of the organism, whose energy acts through the motor nerves. The better the child's health, the better he is fed, the more activity he has to dispense, the more numerous will these motions be. It is motions of this kind that are produced in the foetus, in concurrence with the reflex motions which a touch or a pressure may provoke. It is easy enough to recognise them in the child, and to distinguish them from all others; they have no distinct purpose, and they are not co-ordinate. Such are the movements of the extension and bending of the arms and legs—superfluous, luxurious motions, so to speak—which are produced incessantly, even when the child is asleep. From the very first day we see the child striking his face with his hands or kicking his feet about. One might be tempted to assert that these are but the first awkward gropings of an

* Bain, *Senses and Intellect*, chap. i. Sully calls them "unprompted and random movements." (*Outlines of Psychology*, p. 533.)

† Preyer says that the impulsive motions are distinguished from all others by the fact that they are produced without previous peripheric excitation, and that their cause lies exclusively in the organic processes, nutritive, etc.

instinctive impulse (for instance, in the cases cited, of the instinct of prehension and of walking), the instincts themselves not tending at first, in the case of man at least, to a perfect precision in the actions that they determine. We believe, however, that in the spontaneous motor activity of the child there is something more than the preparation and awkward trial of the instinctive activity. There is, as Bain says, the result of a too copious energy, which is discharging itself for the first time, blindly and at random.* There is the breaking out of a force which has not yet found its channel, a current which has not been directed into canals.

What serves to corroborate this opinion is that these "random movements," as Sully has ingeniously called them, do not disappear with childhood. Even in the adult, when the will

* "I look upon the early movements of infancy as in great part due to the spontaneous action of the centres. The mobility displayed in the first stage of infant existence is known to be very great, and can be attributed only to one of three causes. It may arise from the stimulus of sensation, it may be owing to emotions, or, lastly, the cause may be spontaneous energy. The two first named influences—external sensation and inward emotion—are undoubted causes of active gesticulation and movement, but I do not believe that they explain the whole activity of childhood. If there be times of active gesticulation and exercise that show no connection with the sights or sounds or other influences of the outer world, and that have no peculiar emotional character of the pleasurable or painful kind, we can ascribe them to nothing but the mere abundance and exuberance of self-acting muscular and cerebral energy, which rises and falls with the vigour and nourishment of the general system." (Bain, *Senses and Intellect*, chap. i.)

and habit have taken possession of the muscles, the spontaneous motor faculty still exercises its rights. Let us glance for a moment at our ordinary life, and we shall find that under the impulse of organic stimuli we give ourselves up to numberless motions without purpose and definite characteristics: we extend our arms, we fidget in our seats, we stretch our legs, and these movements have nothing in common, either with the actions that we voluntarily perform, or even with any muscular habits that we have contracted. There is a multitude of parasitic movements about our determined and willed movements, just as we find a vegetation of weeds about the cultivated plants in a field. When a child learns to write, Lewes has observed, it is impossible for him to move only his hands; he keeps his tongue, the muscles of his face, and even his feet, all going at the same time.* Time and the advance of age will diminish these useless motions, but will not entirely suppress them. It is after sleep, above all, when the motor forces have been refreshed by rest, that this automatic gesticulation is particularly active. Is it not natural that, in the morning of life, when the vitality is in its prime, and when the governing rules of action have not yet imprisoned the muscles in the chains of habit, the motor force should play spontaneously and freely in all parts of the muscular system?

But although the reflex movements are not

* Lewes, *Problems of the Mind*, third series, p. 37.

the only ones produced, they have nevertheless a great importance during the first period. Assailed by excitations from without, the little being finds at first in these external impressions only an occasion for a large number of motions, where later he is to gather the material for his ideas. It is to be remarked, however, that the reflex operation, however mechanical it may be, however simple it may appear, is not as easy as the impulsive operation. In the automatic movements the impulse comes from the motor centres, and spreads, by means of the nerves, to the muscles; there is, so to speak, only one current of action, there is only one descending path to travel. In the reflex motion there are preliminaries; an impression from without must excite the sensitive nerves, and this impression ascends to the motor centres, whence it will return to follow the road just travelled. In other words, as Preyer precisely says, a complete series of operations, including sensitive impressions, centripetal, intercentral, and centrifugal processes, is necessary in order that the motion should take place under these conditions. Note, moreover, that in the child, at least during the first days, the impressions from without are somewhat rare. If the reflex action is relatively weak, slow, sluggish, it is not, as Dr. Sikorski affirms, that the irritability of the motor nerves is too slight;* it is not, as Marion claims, that the vitality is less,

* See *Revue philosophique*, vol. xix, p. 533, article by Dr. Sikorski, *Le développement psychique de l'enfant*.

nor because these motions, like all the rest, are perfected by habit; it is rather, we believe, that the sensitive nerves are still dull, the sensibility hardly born. We shall see, moreover, that, thanks to this torpor of the sensibility, the child is not entirely at the mercy of the too pressing solicitations of the outside world, but is protected, as it were, from the brutality of an abrupt revelation of the sensible world.* In proportion as the sensibility is developed the occasions for the production of reflex action will multiply. But, on the other hand, the development of the sensibility will result in the progress of ideas, and the progress of ideas, in its turn, will tend to the suppression, to the annihilation, of reflex motions, which can not exist, by virtue of their fatal and mechanical character, except in the absence of ideas.

There are, nevertheless, numerous and important reflex actions in the case of the newborn child. Reflex action, as we shall soon see, doubtless plays a part even in the development of instinctive motions and of voluntary motions themselves. But it appears alone and unalloyed in phenomena like sneezing, coughing, hiccough, yawning, crying, and even, according to Darwin—who, however, is deceived on this point—in the action of sucking.†

Sneezing, which is often the child's first act on his entrance to the world, presents the type of

* See Chapter III.

† "During the first seven days my child performed several reflex actions, such as sneezing, hiccough, yawning, stretching, and, naturally, *sucking* and crying."

reflex action in all its purity ; it is but the immediate reply of the challenged organism. It is determined mechanically in the infant by an impression of cold, by the abrupt invasion of the lungs by the air. Later it may result from very different causes. "On the thirty-eighth day," says Preyer, "I saw sneezing produced by some drops of lukewarm water that trickled over the forehead ; on the forty-third day I saw that particles of witchmeal caused sneezing ; on the one hundred and seventieth day mere blowing on the child had the same effect. Adults do not readily show such sensibility." *

Another very clear example of reflex action is cited by Darwin : "The seventh day I touched the sole of Doddy's foot with a piece of paper ; he quickly withdrew his foot, and at the same time bent his toes, as a much older child does when being tickled."

There are still other motions that should be considered reflex : first, to be sure, a great part of those connected with the operations of the organic life (the rest being attributed to instinctive impulses), which depend either upon the muscles called "involuntary" in physiology, as the motions of circulation or of the digestive organs ; or upon the voluntary muscles, as the motions of respiration ; and also the motions which come nearer to the mental life—the winking of the eye to protect the eye from too bright a light, the contraction of the limbs to escape a painful con-

* Preyer, the Senses and the Will, p. 214.

tact, turning of the head to avoid a knock or a blow.*

Reflex actions in their original simplicity have no psychic antecedent unless one wishes to consider as such the obscure and unconscious excitation of the sensitive nerves, which is still only an impression and not a sensation, still less a perception. But when the sensibility has increased, when the organs acted upon give birth to agreeable or disagreeable sensations, the reflex act, although always involuntary and mechanical, and, so to speak, inevitable, may succeed a

* I add two examples of automatic motion observed by Binet in little girls six and eight months old : " When the child had her hand open, one could make her contract her fingers and close her hand by scratching the palm of the hand very lightly ; while, if her hand was closed, a slight mechanical excitation on the back of the hand would make her extend her fingers very quickly. This little experiment succeeded under the most varying conditions, whether the child was awake or asleep, whether she was attentive to what was going on about her or whether her attention was otherwise occupied. A second example of automatism is the facility with which one can cause co-ordinate motions in a child whose attention is otherwise occupied, of which he himself is unconscious. I have seen this very often in little girls, and add an example selected from several. A little girl eight months old was looking attentively at a lady who was smiling at her ; her hand was open with its palm downward. A small object, as a key or a ruler, was slipped into the palm of her hand. The child, occupied elsewhere, did not seem to perceive anything, but her little fingers tightened about the object ; they were pressed tightly together and held the object for some time—several minutes, perhaps ; then the hand opened, quickly or slowly, and the object fell to the floor, without the child's having suspected anything."

feeling of pleasure or of pain, a vague consciousness of a danger dreaded or an advantage sought. If a ray of the sun strikes the child's head and makes it too warm as he is seated at his desk plunged in his lessons, he will change his position so that he may be in the shade; in the same way, if the cold affects his legs, he will draw them closer together to warm them.

There are degrees to distinguish, then, in the reflex operations, and it is certain that the parts of the nervous system employed in motions of this kind are not always the same. Bain thinks that some, the most rudimentary, are carried on by the system of nerves and sympathetic ganglions; others, by the spinal cord or the medulla oblongata; others, finally, by higher centres of the cerebro-spinal system, as the mesocephalon and corpora quadrigemina.* It is hardly possible, in the present state of physiological research, to arrive at an absolute decision on this point. But, although we agree with Virchow† in admitting that the newborn child, in the first moments of his existence, is a purely spinal being, and that his activity is placed under the control of the spinal cord, it is not less probable that the brain very soon plays a part in the production of reflex motions.‡

* Bain, *Senses and Intellect*. p. 240.

† This is the opinion of Ribot also, *Les maladies de la volonté*, p. 5.

‡ Automatism was for a long time considered as belonging exclusively to the spinal cord and to the secondary nervous centres. But the works of Dr. Carpenter and of Dr. Laycock

What is certain, in any case, is that, in spite of the apparent analogies, there can be no possibility of confusing even the simplest reflex act with the purely mechanical motions which are sometimes produced in certain species in the vegetable kingdom. There is, doubtless, some resemblance between the action of the newborn child in sneezing or winking and the trembling of the sensitive plant, which folds its leaves at the slightest touch. The child when closing his fingers about objects placed in his hand may be compared to the catchfly plant, which closes its blossoms as soon as an insect lights upon them. But there is here only material for comparison, and the most elementary reflex motion presupposes something altogether different from the simple contractility of the tissues; it comes from a pre-established harmony, from a *consensus* of the different parts of the nervous system; it throws a veritable organism into play, and this may be proved by the phenomenon described by Preyer, of the "irradiation of the reflex motions"—that is to say, the concomitant motions which, for example, accompany tickling and sneezing.

III.

Whatever certain physiologists say on this point—Vulpian, for instance,* who asks, without

have established the fact that the brain also possesses an automatic activity peculiar to itself, which they have designated by the name of "unconscious cerebration," or the "preconscious activity of the soul." (Ribot, *l'Hérédité*, p. 313.)

* Vulpian, *Physiologie du système nerveux*, p. 194.

attempting to hide his perplexity, Where do the sensitive reflex motor actions end? where do the instinctive phenomena begin?—the motions attributable to instinct are recognised by very precise characteristics. They are distinguished from automatic motions in that they are co-ordinate and tend manifestly to a definite end; and from reflex motions, in that they have their origin not in a superficial excitation from without, but in the very depths of our being, in the hereditary habits or the innate tendencies of human nature. Long before the personal will has appeared and laid hold of the muscles, to subject them to an intentional direction, instinct has established regularity in the child's motions. However involuntary and thoughtless the instinct may be in itself, it is already a co-ordinating power, a regulating agent, whether we consider it as the resultant of all the accumulated wills of past generations, or whether we see in it the direct effect of the far-seeing will of Nature.

In the study of the instincts of childhood we must be careful to avoid the extremes both of those who see instinct everywhere and of those who hardly see it at all. Perez, for instance, claims that "sneezing can not be separated from instinct";* there would be, then, if not a god, as with the ancients, at least an *instinct* of sneezing. Rabier, on the other hand, declares that

* "One of the first reflex actions to notice in the child, and one which seems to be hardly separable from instinct, is sneezing." (Perez, *Les trois premières années de l'enfant.*)

instinct hardly exists at all in man.* The disagreement arises from an equivocal definition of instinct. In the eyes of Rabier, indeed, instinct would always presuppose intellectual representations as conditions and antecedents, "a series of images following one another in the consciousness." We believe, on the contrary, that instinct in its original form is absolutely blind, not only because it does not know its end, but because it is ignorant of itself. As soon as intellectual representations are possible and consciousness has appeared the instinctive action in the case of man gives place to desire, and desire journeys on, little by little, to will.† Rabier is wrong, unless he means to speak of the adult only, in whom reason and habit have caused the impulses of the animal nature to almost entirely disappear; but in the child, in so many ways but a little animal, instinct is unquestionably the origin of a large number of actions.‡

* Rabier, *Psychologie*, p. 666.

† "If a feeling of an emotional order, known by the name of desire, comes between a sensation or an idea and the motion it may evoke, this motion has a right to the title of voluntary motion." (Charlton Bastian, *Le cerveau organe de la pensée*, vol. ii, p. 171.)

‡ Compare what Maine de Biran says, in the introduction to his *Anthropologie*, on the characteristics of life in its beginnings: "This purely sensitive existence, these overpowering appetites, these blind inclinations, anterior to all experience, in fine, this *ensemble* of determinations and of automatic motions, which manifest themselves at the beginning of existence and even before the birth of the individual, may be included under the name of instinct, or the sensitive principle—vague title,

In describing the nature of instinctive motions let us take the action of sucking as an example.* Bain states that the act of sucking is a reflex act, which transforms itself into a voluntary act.† But the first part of his statement is inexact, and there can be no doubt but that in this essential operation of life—nutrition—on which the child's existence depends, there is something more than a motion resulting from an external excitation. The best proof that can be given of this is, that, however eager to nurse the child may be when he is hungry, he is as strongly disposed to repel his mother's breast or the bottle if he is satisfied. Doubtless the presentation of the object is necessary at first, in order that the child may satisfy his instinct; but it is not sufficient to cause the motion to continue after the inner need, the real cause, has disappeared. The instinct, then, is pre-existent to the external excitation, since the motion does not continue although this excitation is still going on. Must we go still further, and accept the testimony of certain observers who claim that the child shows his in-

doubtless, as expressing the force acting within the organism, a blind force, ignorant of itself even in its most powerful action."

* "The nursing child does not reason about it when he adjusts his lips and his tongue in the way best calculated to draw the milk from his mother's breast." (Bossuet, *Connaissance de Dieu et de soi-même*, v, 3.

† Senses and Intellect, p. 217. To be sure, we employ the word "reflex" simply as a synonym of an action provoked by an external excitation.

instinct of sucking, apart from any solicitation that excites it. Espinas is of this opinion, and he thinks that he has observed that the child subjected to his experiments, from the very first day of his life, "stretched his head, in yawning, toward the breast of the person holding him, trying, doubtless, to nurse"; the same movement of the head toward the breast was observed in the same child on the fourteenth day, although he was fed by a bottle.* Leaving out of account the fact that the motions referred to might have been caused by the sense of smell, it seems to us that Espinas's observations ought to be repeated and verified; it may be that casual or chance motions have been confused with instinctive motions. In any case it is not necessary that they should be proved in order to show the instinctive character of sucking. In animals, also, a decided instinct demands that they shall act upon the impressions which excite it. Marion tells us that a little chicken does not scratch with his feet when he is placed upon a carpet; but he begins it immediately upon being placed on the gravel, as if the sensation caused by the grains of sand were necessary and sufficient to put the mechanism in motion.

The complicated acts involved in sucking are accomplished from the very first moment with remarkable precision, and, as Bossuet says, "in the manner best calculated to draw the milk

* Observations sur un nouveau-né, in the *Annales de la Faculté des lettres de Bordeaux*, 1883, p. 383.

from the breast." Preyer, who does not wait until the child is fairly in the world to begin his experiments and observations, recounts the following instance: "In December, 1870, three minutes after the appearance of the head—the child cried weakly as soon as the mouth was free—I touched the child's tongue; I passed the end of my finger back and forth over the surface of the organ; the child stopped crying immediately and began to suck my finger with great energy. Will any one contest the instinctive character of sucking by urging the fact (and it is undoubtedly a fact) that the child does not always immediately succeed in grasping the mother's nipple; that it is sometimes necessary to aid him in it?" But these hesitations of the first hour of life are met with in animals also. Moreover, they result, as we have already said, from the insufficiency of the child's organs, or from the difficulties of adaptation to the other organs. The defects of an abnormal organism, in children particularly weak and sickly, could prove nothing against the reality of instinct, of which that organism is but the instrument. In a few days, moreover, all is regulated; every trace of hesitation has disappeared, and the motion is executed with perfect mechanical regularity. It is so, at least, with normal children. In one sense the future intelligence, hard as it may be to believe it, shows itself in the way in which the child sucks. Indeed, a real difficulty in sucking has been observed in idiots from birth: "Every time the breast is presented to them it seems to be a new

thing to them, and each new experience does not unite with the preceding in determining an idea, however unconscious it may be." *

The force of instinct, in its blind and mechanical character, shows itself in the fact that the child sucks anything that is offered him—a finger, a rag doll, any object whatever—as soon as it is placed in contact with his tongue and his lips. Preyer gives an account of the custom of the inhabitants of Thuringia, who keep their children quiet by letting them suck an empty rubber bottle for hours at a time. Although sucking, in this case, does not produce the effect intended by Nature, that of nourishment, still the motion is prolonged. We may compare with this fact the observations of a Parisian physician, who affirms that “the newborn child measures his degree of satiety not by the quantity of milk that he has absorbed, but by the sensation of fatigue which sucking produces; when he has made the motion with his lips for a few minutes, he believes that he is satisfied, even if very little milk has come. Many bad nurses deceive themselves in this way.†

After having established the blind, mechanical character of the motions of the sucking child, we must hasten to observe that the phenomena change very rapidly, consciousness shows itself, and the child soon begins to seek his

* *Psychologie de l'idiot et de l'imbécile*, p. 44.

† Dr. Horace Bianchon, *Causerie médicale*, in the *Journal Le Temps* for February 23, 1891.

mother's breast, no longer under the rule of an obscure instinct, but with a remembrance of the pleasure he has already experienced, the desire to find this pleasure again, and the vague representation of the motions about to be performed again in order to satisfy the needs of nutrition. The phenomena of the child are continually modified in character. We have no sooner defined a passing condition of his mobile nature, always on the path of development, than we must hasten, if we would be exact, to describe a different condition if not an opposing one. The child is like a book whose pages are being continually turned over, one after the other, with no chance of our being allowed to stop in our reading. To-day he is not what he was yesterday. His actions, which seemed at first to be uniform, always the same in reality, are constantly transforming themselves, and their appearance changes, too, to the careful observer.

Everything is mingled in the child—the remains of the animal life and the beginnings of the intelligent life. Then too, however disposed we may be to see the effect of instinct in the act of sucking, we are forced to admit that the reflex operations have their part there too; the act of closing and tightening the lips about the nipple is purely reflex, excited by simple contact. And in the same way, although we feel certain that no antecedent, neither a sensation of hunger nor any idea whatever has preceded the child's first motion toward his mother's breast, there is no doubt but that the child, a short time after birth,

having from this time on a consciousness of what he does when he nurses, is no longer under the exclusive domination of instinct. He does not act voluntarily yet, but the desire, the wish, to obtain again that which has been given him so many times, directs and urges his motions. He already knows this semi-will, which implies, if not the choice between several actions, at least the conscious pursuit of a known end. As proof of this the presence of the nurse excites a desire: the child, who had no idea of wanting to nurse a few moments before, demands the breast with impatience as soon as he sees the person that nurses him.

Contemporary psychologists have brought to light this law, namely, that every state of consciousness tends to express itself to the outside world by movements. In the child, and in the original evolution of our faculties, it is, on the contrary, the movement that precedes the consciousness;* it is the repetition of the unconscious motor phenomenon that seems to call forth the conscious state, emotion, desire, and, later, will. It certainly is not until after he has taken the breast mechanically several times that the sucking child becomes conscious of the motion he is performing. The mechanical life precedes and prepares the way for the conscious life.† At first

* We understand by this, either the knowledge of the act at the moment when it is produced, or the faculty of representing it to the self before it is produced.

† Compare Marillier's article in the *Revue scientifique* (1890, p. 398) on *Les Phénomènes moteurs et la volonté*, in which he

sight children seem to act as though they desired and willed, and it is not until after they have penetrated through these disguises of instinct that they arrive at the reality of desire and of will. It is not enough to say that some of the child's involuntary motions are conscious, some unconscious: the truth is, there are degrees of consciousness; there are subconscious states, semi-conscious states, which hover, so to speak, between darkness and light.

The study of the other instincts of the child reveals the same complexity, and the intervention of the different principles of activity peculiar to man. Habit itself, however unexpected it may be, in a being only beginning to live, loses no time in playing its part in the direction of the motor faculty. We have seen that in the general attitude of his body, in the position which his legs and his feet take, and also in the motion of putting his hands to his face, the child simply repeats motions which were performed in the intra-uterine life. In the same way the new action performed under the guidance of instinct may become habit also. It is not at all necessary that will should have presided at the first manifestation of a movement in order that it should be produced by habit. Every action, voluntary or involuntary, produced once by any cause whatever, tends to repeat itself, to renew itself unconsciously. It is not rare to observe ridiculous

says, "The evolution of the motor phenomena precedes that of representations."

habits in babies as well as in old men, little muscular twitchings, which it is difficult to correct if allowed to become really habitual. The observations made on idiots, the jerkings, the endless grimaces noticed in them, show us, as in a magnifying mirror, the character of these motions of habit, which, in the normal child, will be repressed by the action of intelligence and of the nascent will, but which persist in perpetuating themselves when Nature allows the "part of man, by virtue of which he is a machine," to rule.

IV.

The foregoing analyses will help us to find our way in the midst of the many and varied motions which constitute almost exclusively the child's activity during the first months. Later, in the adult, the inner life up to a certain point will be sufficient to itself. We shall live within ourselves. Our reflections, our cares, will absorb our activity, and they will not always express themselves to the world without. Language, moreover, will be the regular instrument in satisfying the need we feel for communication with others, the stream in which our feelings and thoughts will flow out. But how shall the child, who does not think, who does not talk, occupy his time during the long waking hours increasing day by day, if he does not move? Sense-perception, sensation at least, will doubtless occupy him more and more as time goes on. But this very activity of the senses is accompanied by

motions. There are many movements without an idea in the child, but there is no idea—that is to say, of perception or of sensation—without a movement.

Let us see, then, without pretending to analyze them all, in what category the manifestations of the motor faculty, of which we have not yet spoken, can be placed. Perhaps the conclusion drawn from our examination will be that they all share, more or less, in the different types which we have outlined.

Crying, with which the child enters the world, and of which there will be trouble in breaking him, is represented by Preyer as being purely reflex. There is, assuredly, no longer question of giving it moral significance, of seeing in it with too poetical writers, or even with too symbolical philosophers, the wail of a creature cast into the world only to suffer there. Even Kant did not escape this illusion. According to his theories, the cry of the newborn child should be a sign of irritation and of anger. "It is not that he suffers," he said, "but that something displeases him; doubtless he would like to move his legs, and he feels his powerlessness as he would feel a chain that hindered his liberty."* What could have been Nature's purpose in dooming him to utter cries, which, by their very na-

* Kant varied in his interpretation of cries. Sometimes he seems to see in them only a mechanical phenomenon. "Children aid in the unfolding of the inner parts of their bodies by crying. Consequently one does them a bad turn by trying to quiet them as soon as they begin to cry." (*Traité de pédagogie*,

ture, would be most dangerous to the mother and to himself?" And he adds elsewhere, "If an animal should cry, as children do, upon coming into the world, it would inevitably become the prey of wolves and of the other wild animals that would be attracted by its cries." We willingly grant to Kant that the purpose of Nature in this case is obscure enough, and that it is difficult to discuss the utility of the first cries. But we can not agree with him in interpreting them as the expressive signs of the discontent of a weak being railing at his own weakness. Should we, on the other hand, adopt Preyer's view, and consider them as simply respiratory reflex actions, caused by cooling the skin or by any other disagreeable impression? We believe that there is something more in the prolonged cries, which cease only to begin again, and which are surely out of all proportion to the impressions of suffering that a child could feel. They are spontaneous, and in a great measure automatic. They arise in the newborn child from a general need of action, and perhaps also from a particular need of testifying to his existence, although they are lacking, not only in intentional significance, but also at first in consciousness. And when by frequent repetition, and by virtue of the general progress of the nervous system, they have become conscious of themselves, they are so far

Education physique.) Elsewhere he says: "When the child is capable of laughing and of crying, he cries with reflection, however obscure this reflection may be. He thinks that something is going to hurt him."

from expressing a feeling of weakness, as Kant thought, that they become rather the natural manifestation of a feeling of strength. The child often finds pleasure in crying. Disagreeable as they are for everybody except himself, the cries form a part of the great *ensemble* of natural signs, various sounds of the voice, little grunts, murmurs, and prattlings, which are the preludes to language: simple vocal gesticulation in the beginning, while waiting for the time for them to become signs of appeal when our intelligence shall have comprehended of what use they can be.

The smile, the laugh, we shall see elsewhere, are only automatic motions before becoming the definite expression of a feeling of pleasure or of affection. Tears are the same. Sobs and sighs, which appear early, have at first no expressive import.* This can not be too strongly insisted upon: it is a general law that the child's activity up to the age of four or five months gives no evidence of a real moral sense, still less of the intentional or willed. The reflex mechanism, automatic or instinctive, is organized at the outset; thoughts and will take possession of it later.

Grasping the nipple with the lips is a matter of instinct; taking hold of an object with the

* We do not take time to consider certain motions, frequently produced in the child, pure reflex motions, which have no psychological value—snoring, yawning, hiccough, etc.; nor the respiratory motions, which result from a purely psychical function. As to the motions that accompany the exercise of the senses, see Chapters III and IV.

hands, to seize it and to feel it, is also an instinctive act. Prehension—which is such an important faculty in man, and which will be, later, in the complication of the motions that it demands, the supple instrument of the will and of habit—is performed spontaneously in the beginning. Mme. Necker de Saussure was mistaken when she wrote: “More than five months pass before the child has an idea of making use of his hands; their use is unknown to him for a long time; and the extreme slowness with which he begins to divine it proves that this discovery is the gradual work of experience.”* Long before five months, even from the first days, the child presses his mother’s breast with his hands when nursing, as though to keep it there. The child observed by Espinas thrust the bottle against his mouth with the backs of his hands, and sometimes, too, with his fingers. The awkward first gropings of prehension evidence only the weakness of the organs, and do not prove that the tendency itself to seize objects is an acquisition of experience. If a child that has with difficulty succeeded in taking a plaything or a rattle in his hand, lets it escape, almost immediately, while he watches it aghast, as it rolls about on the floor, it is not the desire to keep it that is wanting; it is only strength or skill.†

* Mme. Necker de Saussure, *L’Éducation progressive*, book ii, chapter ii.

† “Who has not seen and been surprised,” says Luys, “by the incessant motor activity, the never-lagging desire of young children to know the outside world, to seize it in their little

Preyer has studied the motor phenomena of prehension very minutely, and we can not do better than report some of his observations.* In the first place, it can be proved that prehension by the fingers, as well as the contraposition of the thumb, which is its indispensable condition, can be produced without intention, "in a reflex way, as a consequence of the cutaneous excitation caused by the contact of a strange body." Thus, while the child's hands move in every direction, if they come against the extended finger of the nurse, they grasp it mechanically. The same with the rattle, which people usually take the precaution to tie around the baby's neck, because they know that he is incapable of muscular tension sufficiently prolonged to keep it from escaping him. But toward the fourth month desire begins to direct the motions of the arms. If the hand is carried to the face, we can no longer say that it gets there by chance in the course of the innumerable motions in every direction; it has been conducted there. The arms are extended toward a desired object, and the beginning of an effort to attain it shows itself. "It was during the seventeenth week," says Preyer, "that I first noticed real efforts to grasp an object with the hand. This object was a little rubber ball that happened to be within reach, but the child's hand passed to the side of it. When it had been put into his hands he held it in his grasp for a long

hands, to touch everything around them, and to take note of everything near them?" (Luys, *Le Cerveau*, p. 158.)

* *The Senses and the Will*, pp. 241-257.

time, then lifted it to his mouth and to his eyes ; all this with a new and more intelligent expression. The day afterward, the unskilful but energetic efforts of the child to grasp all sorts of objects placed before him became more frequent. A few days later he extended both arms to me, for the first time, when I went to see him in the morning, and his face presented an indescribable expression of desire." It was not only desire, but attention also, expressed by the significant motion of the protrusion of the lips, that animated Preyer's son in these first conscious and intentional efforts of prehension. In a few weeks, as we see, the transition has been made ; and what was at first exclusively mechanical is on the way toward becoming voluntary.

The history of all the child's motions, then, is almost the same : irresistible, blind, fatal impulses at the start ; then, little by little, conscious desires, thoughtless, but lit up by an intellectual representation, by the idea of an end to be attained ; finally, will and efforts : such are the successive causes that determine them. The child, who knows nothing at first, either of his organs or of his motor powers, or of the relation existing between his motions and the satisfaction of his needs, learns all that, little by little ; he understands all his motions and their results ; he comes to direct them, although ignorant of how they are carried on. We shall find characteristic examples of this complex evolution in the movements that we shall study later, because they correspond to a subsequent development, to

a more advanced period in the child's life ; in the the expressive movements,* in the imitative motions,† and even in the movement *par excellence*—walking locomotion.‡ In these phenomena, although the term “voluntary” is employed in designating them, there will always be a reflex and a spontaneous element about which we have just been studying.

* On Expressive Movements, see Chapter V.

† On Imitative Movements, see Chapter IX.

‡ On Voluntary Movements, see Chapter XII.

CHAPTER III.

DEVELOPMENT OF SIGHT.

- I. The newborn child is half blind.—Natural photophobia.—Cuignet's observations.—First manifestations of appetence for light—first for diffused light, then for luminous objects, finally for brightly coloured objects.—The field of vision very limited in the beginning.—The range of sight very short at first. II. Part played by the muscles of sight.—Motions of the eyelids.—A sort of apprenticeship necessary simply to know how to open the eye.—Corresponding motions of the two eyes.—These motions, inco-ordinate at first, become regulated, little by little.—Although co-ordinate, they are still involuntary.—Sight itself helps to develop the muscular mechanism.—How the child comes to follow moving objects with his eyes.—The accommodation of sight is not immediate. III. How the confused picture of external things gradually resolves itself.—Progress of the participation of the brain.—Relative independence of the retina and of the nervous centres.—Distinguishing colours.—Binet's observations.—Yellow and red the first colours distinguished.—Hugo Magnus's hypothesis.—The progressive evolution of the sense of colour.—Colour the first revelation of the sensible world.—The child passes from the world of colours to the world of forms.—The act of recognising persons and things implies the perception of shapes and forms.—Appreciation of distances.—Attention's rôle.—Influence of moral causes on the development of sight.—Imperfection of sight in imbeciles and idiots. IV. The visual perception of space.—Nativists and empiricists.—The perception of distances is not innate.—Preyer's observations.—The child shows by the

awkward motions of the hand that he does not appreciate distances.—Observations made on people born blind.—The perception of distances the result of experience.—The visual and tactile impressions are not combined at first.

IN beginning the study of sight and of the other sensations or perceptions of the child, we shall enter into the domain of the intellectual life and into the history of the humble beginnings of the mind. However simple the act of perceiving, this first intellectual element, may appear to be, it must not be thought that perception is possible from the first day. And, to speak first only of the most important of the senses—of sight—I would say that it is by no means a paradox to state that the newborn child learns to see just as he will later learn to walk, as he learns to hear, to touch. Kant said that during the first three months children's sight is not complete. They receive the sensation of light, but can not distinguish one object from another. "It is easy," he says, "to convince one's self of this by showing them something bright. They will not follow it with their eyes." A sort of evolution, of natural education is necessary, that the child's eyes may become accustomed to the light, then that he may form the habit of directing his looks, of fixing them upon objects, of recognising them, of discerning their colour and their form, and, finally, of appreciating distances. Here, as everywhere, one of the characteristic laws of the development of mankind reveals itself—the law according to which the child acquires by exercise and learns by experience all that Nature teaches the lower

animals in the beginning, all that she suggests to them by blind and irresistible instincts; with the exception, of course, of a few of the child's actions governed directly by instinct, which, however, constitute a minimum of the operations indispensable to the preservation of life.

I.

Every child is to a certain extent blind at birth. He sees enough to be hurt and disturbed by the light, if it is bright, but not enough to distinguish objects. Doubtless he will not be long in showing himself eager for the sensations produced by light. In a few days the light of a candle will be enough to throw him into a sort of ecstasy. But in the first weeks he shows by certain signs that, far from liking the light, he has a fear of it, so to speak. Observers of child nature, conscientious in other respects, have erred in admitting as an established truth the opinion that the newborn child seeks for and enjoys the light of day from the very first moments of his life. Tiedemann shows no hesitation on this point: "It is known," he says, "that when children come into the world, and as often as they awake afterward, they turn their eyes toward the light: a fact which proves that light produces an agreeable impression."*

* The error is a frequent one. We find it again in Ribot's book, *La psychologie allemande* (p. 11, note): "A few hours after birth the child follows with his eyes the motions of a light a short distance from him."

Facts flatly contradict this assertion. Physicians have observed in adults what they call morbid photophobia, which causes certain nervous states, or, rather, inflammations of the eye. In the case of the newborn child, the fear of light, a sort of natural photophobia, is the normal state. When he opens his eyes for the first time, after the almost uninterrupted sleep that he has been enjoying, he closes them almost immediately, as though dazzled by the light of day. In this first contact of his delicate organs with the ether waves, on coming out of the dark prison in which he has lived for nine months, he feels in an intense degree the impression of discomfort which the sudden appearance of light succeeding darkness produces even on the experienced eyes of the adult. It is for this reason, doubtless, that the child has a marked tendency to sleep in the daytime rather than at night. "The eyes of the newborn child," says Espinas, "open by preference at twilight and in the evening."* Preyer, who can not be accused of any lack of precision and vigilance in his experiments, since his son had not been in the world five minutes before he held him at the window at dawn to observe the effect of light upon him, recognises also that the child feels at first a real antipathy toward light.† Cuignet, to whom we are indebted for very interesting observations upon two children, studied from birth to the complete development of the

* *Annales de la Faculté des lettres de Bordeaux*, 1883, p. 383.

† *The Senses and the Will*, p. 5.

faculty of sight, is very positive in his opinion: "The second day, the child likes darkness better than light; he does not open his eyes except when in darkness." * If he half opens his eyelids during the day he immediately blinks his eyes. Do not let us look yet for those beautiful, clear, and fixed looks which later will render his countenance adorable. The newborn child squints; he squints to avoid the brightness of the light. "He has from birth a marked convergent power which permits him to shelter his eye in the dark chamber formed by the angle of the eye.† Just as we make a sudden inclination of the head to avoid a stone about to strike us, so the child by a sort of instinctive strabism turns the pupil to protect himself from the blinding light.‡

The observations made upon people born blind to whom a successful operation has given sight confirm, by analogy, what we have just said of the child's first impressions. In the case of a woman forty years old, who had been blind from birth, operated upon by Wardrop, the sudden brightness of day produced a disagreeable sensation; the woman complained that the light

* *Annales d'oculistique*, Bruxelles, vol. lxvi, p. 117.

† *Ibid.*

‡ Compare the following observation: "We have seen a child three months old, when a light was brought near him, lying in his cradle, draw his coverlet up little by little until it reached his eyes and hid him completely, doubtless, because the brightness of the light hurt him." (*Espinas, Les Sociétés animales*, p. 52.)

hurt her eyes.* So, in the case of a child attended by Home, the light was manifestly disagreeable to the eye: the pupil was clear, but the patient could not endure daylight.†

According to Cuignet, the strabismus of the newborn child lasts until the twentieth day. It is probable, however, that this state of uneasiness and suffering does not last as long as this. The child observed by Espinas did not dread the light after the fourteenth day. But it is quite certain that a second period begins very soon, toward the third week, when the child's eyes have served their apprenticeship, and show a decided taste and a manifest appetite for light. Simply letting in the light will often quiet a crying child. I know very well that he is not yet capable of following an object with his eyes, nor of fixing his gaze upon it; but the light spread around him, the diffused light, pleases him—it causes agreeable sensations. Cuignet found that his son seemed to tire of being in darkness too long from the sixteenth day, that he was quiet as soon as a candle was lighted, that he seemed to enjoy a soft light shed upon the objects about him.

But very soon the child is no longer contented with the vague pleasure that he finds in being plunged, as it were, in a bath of light. After a few weeks his eyes have gained strength enough to look at luminous objects. Darwin even claims that from the ninth day the gaze of his son Doddy

* See *Philosophical Transactions of the Royal Society, London*, 1826, vol. iii, pp. 529-540.

† *Ibid.*, 1867, vol. i, pp. 85-87.

was fixed upon a lighted candle. A moderate and diffused light at first, then a bright light, not too bright, however, centred in a luminous object, that is what pleases the child. Up to the forty-fifth day, Darwin says further, no other object seemed to attract Doddy's eyes to the same degree as did a lighted candle. It is necessary, to be sure, that the candle should be placed at some distance from the child; if too near it would oblige him to blink, or even to completely close his eyes. But when this condition is complied with, it seems to be established that the child sees and looks at luminous objects first—the flame of a lamp, the fire in the grate. Objects that simply reflect the light will not attract his attention until later, and then beginning with the brightest, those whose colours are most striking; for instance, the gaily coloured tassel regarded with admiration by Doddy on the forty-ninth day, as was evidenced by the fixedness of his gaze and the sudden immovableness of his arms; or again, the red curtain brightly lighted up by the sun which Preyer's son greeted with a smile of content on the twenty-third day.

It is in the education of sight—that is to say, of the most essential, the most complicated of our organs of sense-perception—that Nature has introduced the greatest number of steps, of little progressions, and that she has employed the most caution and delay in conducting a faculty, seemingly innate, to its final development. Step by step, as has been said, sight becomes accustomed to lights more and more intense, and extends

farther and farther the limits at which the eye is dazzled.* But even this light, spread abroad or centred in a single point, the eyes can not grasp immediately in all its directions, nor perceive at a great distance. On the one hand, the field of vision is restricted for the newborn child; on the other, the range of sight is limited and short.

However little we may observe the child, in the first gropings of sight we are convinced that his eyes do not perceive objects situated to the right or to the left of his little body. The newborn child sees only in a straight line before him. His sight is confined, as it were, in a narrow passage; there is, so to speak, a wall on both sides of him, which prevents sight from acting in a direction other than straight in front of him. To test this, move the candle that he has looked at a few centimetres to the right or to the left, or even above or below its former position, and you will see that he has lost sight of it, and that he allows his eyes to wander about aimlessly.

It is easy to understand why the field of vision is so limited in the beginning. The first reason is that the child has not yet the faculty of moving his eyeball easily and that he has not, above all, the power of moving his head, since he can not even hold it upright. But it is only by means

* Certain animals can exercise their sight with less light than children: there is no doubt, consequently, but that dazzling begins sooner for them, and that the intense light of the noonday sun, for instance, would cause a very disagreeable impression.

of the motions of the eye and of the head that the increased power of vision will attain later its normal extent in every direction. Another more subtle reason is that, according to the observations of physiologists, the sensibility of the retina would be confined to the central tract; the peripheric parts would not become sensible to light until later, and then little by little.* Therefore the limited visual perception of the newborn child would not depend merely upon the muscular weakness, the inability to turn the eyes from one side to the other; it would be caused also by the imperfection of the nascent organ. Reduced to a central sensibility, the retina would not be in a condition to respond to the lateral solicitations of surrounding objects.†

Another fact, as indisputable, is that sight has at first only a very short range. Place a lighted candle two or three metres from a child fifteen or twenty days old; he will look at it fixedly; if you place it three, four, or five metres from him, it will become evident that the child has lost sight of the light, and you will be sure from the uncertainty of his glances that he no longer perceives anything. Here, too, there is a progressive development, and it is hard to say exactly at what time the child acquires the regular range of vision. According to Cuignet, a child two months and a half old would see seven or eight metres.

* On this point see Hugo Magnus, *History of the Evolution of the Sense of Colour*.

† According to Cuignet, at two months and a half the child would have still only central vision.

According to Espinas, the child two months old would not perceive anything farther away than fifty centimetres; a child three months old not farther than a metre.* Perhaps these contradictions arise from the fact that in the two series of observations the objects considered were not of the same nature: in the first case, the flame of a candle; in the second, simply an object in the light, the face of a person. However this may be, bearing in mind the fact that in the education of sight, as in all the other faculties, the natural inequalities of health and of strength may advance or retard the date of the complete development of the organs and their functions, it is proved that adaptation, accommodation, which permits the eye to see at greater and greater distances, is organized only slowly and progressively. Every newborn child is a provisional myope.† The picture of exterior Nature, with all its perspective, its depths, and its backgrounds, is not unrolled at first before the astonished and enraptured gaze of the child. He does not enter the world, as we do the theatre, upon a scene all arranged in advance, which the spectator sees as a whole at one glance; it is piece by piece, bit by bit, that the world of visible things presents

* At one year the child observed by Preyer distinguished men sawing wood more than a hundred feet away.

† The experiments made by von Jager in 1861, and attempted by Preyer, confirm this point. It is true, the same author cites contradictory experiments, and concludes by urging the necessity of new observations on this point. We believe that "innate presbyopia" is the exception, at any rate.

itself to his eyes, and that the curtain that covered it is torn away and raised.

The two causes that we have already stated contribute to extending the range in front as well as to the progress of the lateral extent: First, the state of the retina, which gains its sensibility little by little, from the centre to the periphery, so that the image which should be formed exactly on the retina, and not in front of or behind it, in order that the sight should be clear and distinct, has henceforth more chances of being produced under the required conditions; in the second place, the growth in strength of the muscles, of those that allow the eyeball to move and to change its position within certain limits, as well as of those that assure the movements of the head itself. It is with this last point that we are now about to occupy ourselves.

II.

Vision, it is known, does not result merely from the sensibility peculiar to the optic organs; it presupposes determined motions which of themselves render clear and complete sight possible.* Visual perception is not, as one might think, a simple passive reception of the luminous ray, striking a screen prepared to receive it. There appears here, as everywhere, this neces-

* Maine de Biran wrote in his *Memoire sur l'habitude*: "It is difficult to say in what narrow limits the functions of sight would be circled, if considered apart from the particular mobility of this organ."

sary condition of all mental phenomena; collaboration, participation of the inner activity, which is reduced, it is true, in the present case, to motions. And even the most rudimentary of these motions are not performed regularly from the first day. It is not only the optic sensibility that is weak and incomplete in the newborn child; it is not only attention and intellectual force that are lacking, whether in fixing and looking at objects or in interpreting sensible appearances; it is the physiological mechanism that is still imperfect; it is the material apparatus, the muscular apparatus, that does not act normally. There is in this a period of gropings analogous to those of an astronomer who is trying to point his telescope and who can not clearly perceive the star that is the object of his investigations unless he adjusts the instrument exactly.

If we were still imagining that there is nothing acquired in the exercise of the sense of sight, that all is innate, it would be sufficient to undeceive us to examine the motions of the eyelids, and to see that a sort of apprenticeship is necessary in order merely to open the eyes. It is a question of very simple motions, however, in this case. At the same time an essential condition of sight is involved, since the motions of the eyelids, when co-ordinate, have no end other than to raise for both eyes at the same time, and at the desired moment, the veil, the curtain, which hides Nature from us when it is lowered. But for a few weeks the motions of the eyelids present neither co-ordination nor symmetry. One eye

opens while the other remains closed. On the other hand, the eyelids do not accompany the pupil regularly in its own motions. All observers agree on this point, and affirm that the co-ordination of the motions of the eyeball with those of the eyelids does not exist at first. One motion only seems to be innate, and yet Darwin doubts this; it is the motion by which the eyelid is lowered and the pupil protected from the wounds of too bright a light. As to the squinting and the blinking of the eyelids, which the approach of an object causes instinctively in the adult, what Preyer calls the "test of the aggressive hand," this is not produced during the first weeks either.

But what is much more important, and this is progressive, too, is the adjustment of special contractions by which the muscles bring about corresponding motions of both eyes. The child learns to use the ocular muscles to see, just as he will learn a little later to use the crural muscles to walk. And there are several stages in this education: First, motions that are not co-ordinate; then motions that are regular but involuntary; finally, and it is only then that the child really possesses the faculty of directing his glances, voluntary motions.

It is easy to prove that the motions of the child's eyes are not co-ordinate in the beginning. The right eye looks to one side, the left to the other. There is no association yet, no convergence in the motions that cause the eyes to look up or down, without or within, to the right or to

the left. "More accurate and often repeated observations of the eye movements of the child," says Preyer, "especially during the first six days, taught me that the simultaneous turning of both eyes to the left or the right is not co-ordinated with complete symmetry, as it is in adults. In a child ten hours old, and in another six days old, both of whose eyes were wide open, I saw motions several times that seemed to be co-ordinate in both eyes. But on closer examination these motions showed that they were not of exactly the same direction. On the whole, I have found in the newborn child that one eye often moves independently of the other, and that the head is often inclined in a direction different from that followed by the motions of the eyes.*

This picture of the child, which represents him as an ugly, grimacing thing in the incoherence of his ocular motions, we are at first tempted to reject as inexact and false. People will say: "Who has not seen very little children look, or at least turn their eyes in the same direction with perfect ease—for instance, on the face of their mother or their nurse, when she speaks to them or smiles at them?" There certainly are numerous examples of agreement in the motions of the eyes from the very first days. What still remains true, however, is that this seeming agreement is a chance one; it arises from the excitation produced by a very bright object which, being in the field of vision, holds the uncertain gaze

* The Senses and the Will, p. 36.

of the child and forces upon him, so to speak, regularity of his muscular contractions. This is what Preyer thinks, who declares that he has never found in any child the exclusive existence of co-ordinate motions, and that he has established the existence of inco-ordinate motions up to the age of three months.

Some time must pass, then, for the useless disjointed motions, which are of no value to sight, to be effaced in the general current of normal life, that they may give place to the only useful motions, to those that assist the child in seeing, and that from this sort of original chaos may come, insensibly, order and regulated direction. There is the child spoken of by Espinas, who knows how to follow the light of a lamp, being moved from place to place, on the twenty-sixth day;* who when two months old directs his glances better and better, and even fixes them upon the eyes of the person talking to him. And Cuignet also shows us a child looking about him the twentieth day without moving his head, by the mere motion of the eyeballs. The mechanism of the muscular apparatus gains strength from day to day; the head becomes accustomed to accompanying the motions of the eyes, and the sight, thus carried in every direction, acquires its full range.

But it must not be imagined that will plays any part in this progressive regulation of the

* Compare the observation of Preyer, who found the same action on the twenty-second day (p. 35).

ocular motions. Will does not exist until much later. If it were true, as Preyer says, that all "fixation" of the glance is an act of will, we should have to conclude that fixation is a thing unknown to the child. It is not so, however. We have all seen the prolonged contemplation in which a very little child indulges when the flowers in a curtain or brilliant objects of any sort are before him; his face, ordinarily so changeable, resembles that of a meditative or rapturous person. The cause of this is not in a voluntary intention, in a personal effort, in an inner power of concentrating his gaze wherever he will, but simply in the excitation produced by the luminous perceptions which attract and captivate the child. It is the muscular mechanism that when once regulated will permit sight to extend in every direction, to radiate, to become that wonderful sense of touch by means of which a star in the infinite heavens may be grasped. But it is sight itself that calls forth the development of the muscular mechanism in the beginning. Indeed, when the child has looked a certain number of times upon objects naturally placed within his range and his line of vision, his ocular muscles form, as it were, the habit of associating their motions; they do this by the simple force of circumstances under the rule of a dominant sensation continued or often repeated. And when they have once taken their bent they hold to it—that is, they become qualified to associate one with the other, instinctively, under the impulse of a desire, of an inner curiosity—so that when will

appears it will find the optic mechanism ready to act according to its orders.

It is the fact of vision also which, coincident with the development of the muscular forces, with the consolidation of the muscles, explains how the child's eye reaches the point where it moves easily, how the child removes his gaze to follow the motion of objects. He arrives at this point by slow stages. "I was surprised," says Darwin, "to see how slowly my son acquired the faculty of following an object with his eyes when it was waved quite rapidly before him; even at the age of seven months and a half he had not acquired it fully." "It was not until the twenty-ninth month," says Preyer, "that I saw the child follow the flight of a bird with his eyes. Still more time was needed for him to follow the objects and playthings that he allowed to fall to the floor after having amused himself with them." It is slowly moving objects, as the pendulum of a clock or a heavily laden cart, that the child first follows with his eyes. His sight, a prisoner of the sensation of light that enslaves it, determines the muscular motions necessary in order that this sensation should continue, that the moving object should remain within the field of vision. If the displacement of the objects is too sudden the eyes come to a halt; the continuity is broken; the muscles are not yet strong enough or trained enough; they can not quickly make the eyeball perform the motion indispensable to the adaptation of sight to a new distance. A child whose eyes can follow the smoke of a

puff of tobacco or the course of a cloud in the sky still can not change the direction of his glances quickly enough to follow the swallow cleaving the air, or even the plaything that falls from his knees to the floor. In the first case accommodation—that is to say, the faculty which the eye possesses of adapting itself to different distances in order to see well—is carried on insensibly; the glance, as though gently led by a string, obeys and yields to the action of the luminous sensation, like a young dog allowing himself to be led by the end of a string which has been put in his mouth and of which he does not wish to let go. In the second case, the transition is not gradual enough for the motions of the eye to be performed, and the glance is disconcerted, loses trace of the object. A long training of the muscles is necessary under the first form, in order that the second operation may become possible, that the muscles of the neck and the ocular muscles may acquire sufficient flexibility, and that they may make the position of the head and of the eyes agree exactly with the position in space of the moving object, which is tending to escape from sight.

Let us conclude, then, that the muscular apparatus, which assists sight, does not act immediately in the normal conditions, in man, at least; for the case seems to be different in animals, in the chicken for instance, which can appreciate distances as soon as it is out of the shell, as is shown by the way it plunders grain, and can follow with unfailing precision the motions

of an insect crawling on the ground. In man there is no inherited or innate accommodation, adaptation of the visual functions. Nature furnishes the child directly with luminous sensations only, sight, more or less distinct, of objects placed directly before him at a limited distance from him; and yet, as we have seen, she does not do this even until several days have passed, and the organs have become strong enough to endure the nervous excitation of light. In order that sight should succeed in conquering space it is necessary for the muscles to enter into play, and it is exercise alone that will render the muscles flexible, that will strengthen them little by little and be the means of educating them.

III.

A person born blind, upon being asked what impression he felt a few days after the operation that had given him his sight, answered: "I see an extended bright field where everything seems dim, confused, and in motion."* It is thus, probably, that the picture of external things appears to the first glance of the child. Even when two or three months old the child does not distinguish one object from another. A few bright points, the flame of a lamp, the sparkling eyes of his mother or of his nurse, a brightly coloured plaything, appear first on this dim, confused scene which the world presents to him.† New images are

* Philosophical Transactions of the Royal Society, 1841, vol. i, p. 59.

† "I feel certain," says Taine, "that for the first two months

detached little by little from the vague whole, define themselves clearly, particularize themselves in distinct sensations, according as the objects present themselves to him with more or less intense light or colour. The child goes from discovery to discovery; from the second to the third month he seems to perceive for the first time objects or persons that have been before him from his birth. The canvas is animated little by little; all the parts become brighter. The colours are distinguished first, and with them consecutively the forms that they determine later, the relief, the depth of bodies. As in a scene formed by the scene shifter little by little, to amuse the spectators, each object comes to take its place successively in the field of vision, and at the same time that it widens, extends its depth.

In this work of elaboration which enlarges the child's visual horizon, which makes complete clearness about him, which enables him to discern and interpret sensible phenomena, which, in a word, substitutes real perceptions for confused sensations, it is necessary to take account of the general cause, which is the condition of all mental development and which alone renders complete vision possible: I mean the progress of the participation of the brain. The first luminous impressions interest only the retina, the optic nerves, and the optic thalami; they do not com-

the outside world to the child consists of a few sounds and a few specks of colour which he can not place." (De l'Intelligence, book ii, chap. ii.)

municate themselves to the brain, which is not yet in condition to receive and use them. The child's brain, we must not forget, is in process of development. It is only in the second month that the convolutions and the ganglionic cells appear. "Anatomists say that in the first months of the intra-uterine life, the retina is absolutely independent of the encephalic nervous centres; it is not until a later period that the nervous elements of the retina and the cerebral masses will unite through the medium of the optic nerves."* It is probable that this union is not accomplished immediately after birth; and, in any case, exercise is necessary to the formation of broad and convenient paths of association between the different parts of the nervous system, and to the establishment of a correspondence, a regular communication, between the images formed on the retina and the cerebral centres, whose co-operation is indispensable in any real perception.

But although the progressive organization of the brain and its action ruling over all must be taken into account, it is none the less true that a local work, so to speak, is carried on in the eye itself, in the state of its nervous elements as well as in its muscular apparatus, which has its part in bringing the child's sight, little by little, to the highest point of its development.

So far we have spoken only of the distinction

* Dictionnaire de médecine et de chirurgie, Dr. Jaccoud, article Œil.

of light and darkness, of day and night—that is to say, of the sensibility to white or diffused light. But very soon the child gives evidence of being sensible also to the accidents of light—that is to say, to colours. Pink or red ribbons lighted up by the sun, gilded frames shining in the lamplight, a bouquet of flowers, in fine—everything that is coloured, that is bright, appeals to children's sight and delights them.

At what moment does the eye of the child go beyond simple sensibility to light and begin to discern colours? We can not tell this exactly. The minute and precise observations made by Preyer and Binet on the sense of colour apply only to children two or three years old.* They have the common plan of presenting to the child samples of different colours, and of ascertaining how many times he correctly names the red, the green, the yellow, etc. These are rather, to speak exactly, experiments on language and the progress of memory; for it is evident that the child can distinguish the colours perfectly, and, as a matter of fact, it is certain that he distinguishes them long before he possesses the infallible faculty of associating each one with the name that designates it in the language of men. It is precisely for this reason that Binet has substituted

* "In order to find out how it is with simple colours, I made several hundred experiments on my son, beginning with the end of the second year" (p. 6). "I have studied the chromatic sensibility in a little girl from the age of two and a half to three." (Binet, *Revue Philosophique*, article *Perceptions d'enfants*, 1890, vol. xxx, p. 584.)

for what he calls the method of appellation of Preyer, the "method of recognition," which consists in making the child select from a bunch of samples of different colours a particular one that has been shown him before. This method has the advantage of doing away with the complications resulting from the inexpert management of language and of avoiding the confusion of words, which does not always correspond to a confusion of things. But it implies, on the other hand, that the child understands what we want to say to him when we ask him to select the sample at first presented, then removed from his sight. It can not be employed, then, in the case of the very young child, and Binet has applied it only to subjects two or three years old.

These experiments, although applied a little late, give us, nevertheless, some information concerning what has previously taken place in the eyes of the newborn child. If it is, indeed, proved that the child about two years old recognises or names one colour with more certainty than another, it is allowable to infer that this order of more or less correct designation corresponds exactly to the order of acquisition and is the consequence of it, and that it reveals to us the order of evolution, according to which the retina has become sensible successively to different colours. But, without being exactly identical, since the children observed by Binet recognised red most easily, while Preyer's son named yellow with most certainty, the results of these two series of observations seem to prove that these two col-

ours affect earliest the chromatic sensibility of children.

Red and yellow, the very colours represented to us by the suppositions, a little imaginative, to be sure, of some of our contemporary evolutionists, as having been the only ones perceived by primitive peoples! According to Hugo Magnus, the world of material things has not always appeared to man with the colours that adorn it to-day, perfected for our senses by heredity. Two thousand years ago humanity would not have been capable of perceiving anything but the extremity of the solar spectrum, the red, the orange, the yellow, without being able to distinguish the green, the blue, the violet. And Hugo Magnus pushes the paradox to the point of claiming that the author of the Homeric poems, as well as the authors of the Bible and the sacred books of India, had so little perception of colour as to see only red and yellow in the universe. These fancies have been justly disposed of ;* it has been shown that in the pretended insensibility of primitive peoples respecting certain colours there is manifested simply a poverty of language in expressing sensations which are nevertheless distinct. But without intending to find fault with Hugo Magnus's hypothesis in itself as a general formula applicable to the evolution of the sense of colours in humanity, it seems at least to express the history of the perception of colours in the little child.

* Notably in Grant Allen's work.

If the eyes of the newborn child seem at first to be indifferent to colours, there comes a change at the end of a few weeks. The first time richly coloured objects are shown him the sensation must be like that described by Wardrop as being produced in a person born blind from whose eyes cataracts were successfully removed; the visible world agitated him greatly. "One day," said Wardrop, "I gave him some new clothes of very bright colours; he was delighted beyond all expression; it was the most interesting display of sense pleasure that I have ever seen."* The child offers us what Haeckel has called a "raw" state of the sense of colours; he is not sensible yet to delicate shades, to mild tints, to blue or to gray, and selects by preference the strong colouring, which later will shock the eyes of the adult.† A little boy spoken of by Preyer began at the age of four months to prefer bright red to other colours.

From these facts we conclude, not that the child is incapable of perceiving soft colours, but that he likes them less than the strong ones. It is probable, however, that perception and taste go together, that the colours the child likes best are at the same time the first perceived, especially as the natural disposition to distinguish red

* See Dugald Stewart, *Elements of the Philosophy of the Human Mind*, vol. i.

† "In all probability the child a year old still perceives green and blue as though they were gray; in any case, he does not distinguish them as clearly as he will later." (Preyer, p. 146.)

and yellow first seems to be explained by the fact that these two colours correspond to the longest and the most powerful waves of ether. Let us not forget that the red is the first ray visible in the spectrum. In any case, as has been demonstrated by the experiments of Thomas Young and of Helmholtz, since the nervous elements impressed by the elementary colours are not equally distributed in the retina, and, on the other hand, the sensibility of the retina is developed gradually from the centre to the periphery, we have some right to affirm that there is in the child a progressive evolution of the sense of colour.

But what is unquestionable, and would be a certain *a priori*, supposing that experiment did not furnish us with a confirmation, is that the child, in one order or another, very soon perceives the principal colours. And it is by the colours that the exterior world is revealed to him and becomes the object of visual perceptions. To the child the universe is not at first a collection of solid things, each independent of the other, placed at different distances; it presents itself to him only as an extent of surface, vari-coloured like a picture, in which all sorts of things are painted. First the sensations of light, then sensations of colour; those are the two stages which vision passes through before arriving at really objective perceptions. There is a period of longer or of shorter duration, during which the world presents to the child only bits or streaks of colour, which form for his eyes a mosaic of different col-

ours. What goes on in the child's brain at this time must closely resemble the impressions which Kaspar Hauser declared he had felt when one day, soon after his arrival at Nuremberg, he was taken to a window at the top of a tower and told to look down upon the landscape. "I had," he said, "an impression analogous to that which would have been produced by a window shutter very close to my eyes, on which had been daubed blots of white, blue, green, yellow, and red, one next to the other. I could not then distinguish and recognise the separate objects as I see them to-day."

It is from the world of colours that the child's sight passes to the world of forms. The colour coincides, indeed, with the surface, with the extent of two dimensions, and by the sense of sight alone, without its being necessary to resort to the medium of touch, without feeling the corners of objects and following their contour with his fingers, the child recognises the form of things with great certainty. Up to this time he has received only sensations of sight, which are almost exclusively subjective; from now on, through sight, he will receive knowledge—entirely objective perceptions. Images are no longer sketched only in the retina and in the optic thalami; they are formed in the brain and in the mind; and these images soon acquire enough precision for the child to be able to distinguish one from the other; as he evidently does, as soon as he can recognise persons and has a different welcome for his mother or his nurse, whose appearance

calls forth a smile of joy, and for the stranger who astonishes and frightens him. Preyer states that his son at the age of two years recognised the photographs of people who were familiar to him. But long before this the child greets the persons themselves in a very significant way, proving that he remembers their faces, and that he has consequently distinguished them in his perceptions. This fact is explicable only on one condition, namely, that the face, the stature, the whole body of these persons, have left a distinct impression of their form in the child. Darwin says: "At the age of four months the baby showed by certain signs that he recognised and distinguished between different people. At four months and a half he often smiled on seeing my image and his own in a mirror." Likewise, the child observed by Preyer at six months looked attentively at the reflection of his father's face in a mirror, then turned to his father as though intending to compare the image with the original. Tiedemann found that his son, when in his fifth month, turned away from people dressed in black with plain signs of repugnance; in this case the sensation of colour is uppermost in the visual impression. But this same child, three months afterward, showed evident signs of affection for people that he knew, and in this case it was the distinct and clear perception that guided the affectionate sensibility. The child observed by Cuignet recognised his mother at two months; he looked at her attentively and smiled, while he did not smile at other people, and already hesi-

tated to let strangers take him in their arms. We might multiply examples of this sort. We have all seen very young children distinguish persons, which is not possible, we repeat, except by virtue of visual images, tracing exactly the portrait of these persons.

We may even believe that the child's perception has remarkable exactness in this work of representing lines and forms. We may find a proof of this in the observations undertaken by Binet concerning the appreciation of distances : * it was found that a little girl two years and a half old, when called upon to look in turn at lines of unequal length, noticed even very slight differences, and showed almost as much precision in a glance as would a grown person. "Nothing could be more curious," says Binet, "than to see this child place her index finger on each one of these lines with such certainty, saying each time, 'This one is the shortest,' or 'That one is the longest.'" I do not deny that at two years and a half the visual perception has already made great progress, and that we can not infer from what happens at this age that like conditions exist at the age of ten or fifteen months. It is allowable to suppose, however, that the child's glance becomes very early quite exact and precise. It is a law of the evolution of the faculties that the lower functions, those that do not yet presuppose reasoning, attain very rapidly an advanced degree of perfection. The child, who is

* *Revue philosophique*, 1890, vol. xxx, pp. 68 *et seq.*

so visibly inferior to the adult in force of judgment and in power of abstraction, shows himself to be almost his equal when it is a question of seeing, of measuring surfaces and lines at a glance, and, above all, of representing to himself with clearness the forms of realities.

For the child, moreover, to appreciate distances, like a little geometrician, and for him to represent to himself by a mental drawing either the persons or things that he knows, there is need, to be sure, of something more than the normal development of the nervous and of the muscular apparatus which constitute the material organs of sight: attention must interpose. It is the lack of attention, according to Binet, that has more than once perverted the results of the experiments to which he has submitted his children. And not only attention, but curiosity, sympathy, astonishment, intellectual and moral instincts which are sprouting and beginning to appear, play an important part in the progressive development of sight. The eyes which during the first months do not open wide except when under control of a material pleasure (when the child is nursing, for instance), will open at eight or nine months under the influence of surprise. There is a first period during which the child, so to speak, sees automatically; later he sees intelligently, he *looks*. In the first case he is plunged in a sort of vague, torpid contemplation; in the second case he shows a satisfied countenance, which reveals the intelligence, and it is then only that his glance becomes beautiful.

This influence of moral causes stands out forcibly in the counter proof to be found in examining idiotic or imbecile children, and in ascertaining the slowness, the deficiencies of the sense of sight. Perception presupposes not only an action produced by the external phenomena on the appropriate organs: it implies also a reaction of the brain, or, in other words, of the intelligence and of feeling. With perfectly healthy organs of sense, the idiot and the imbecile have only very imperfect sight in their childhood. They see, but they do not really *look* at anything; or, on the other hand, being plunged in a dull and obstinate immobility, they do not know how to change their position in order to follow objects with their eyes. "However," says Sollier,* "apart from the fact that the pupillary modifications show that the eye itself is not reached, we see them, when under the influence of an appropriate excitant, change the direction of their glances." It is established, then, that the imperfections of their sight result from that which the inner activity lacks, the intelligence and the feeling not being sufficiently developed to set the mechanism of the sight in motion.

IV.

There remains one last question for us to treat, that of the visual perception of distance or of space—a much debated question, to be sure. The nativists, Müller, Hering, Giraud-Teulon, to cite

* Psychologie de l'idiot et de l'imbécile, p. 48.

but a few, on one side, and the empiristic school, as Helmholtz, one of its leaders, has called it, on the other side, are at swords' points: the one holding that the perception of the third dimension of bodies and of distance is innate in man, as it certainly is in animals, and that it follows immediately from the play of the hereditary mechanism, completely organized from birth; the others affirming, on the contrary—and we believe that the study of the child bears them out—that it is a more or less slow acquisition of experience, the effect of a progressive accommodation of the sense of sight.

Let us try to show first by facts that the perception of space is not given to the child immediately; afterward we will try to see how this perception becomes possible.

Every one has seen how the child gropes and how he deceives himself when it is a question of appreciating the distance of objects. Preyer has noted a great many observations from day to day showing this lack of power. The fourth month the child stretches out his hands to seize objects that are distant twice the length of his arm from him, and although disappointed, he tries several times to accomplish his purpose. At one year he holds out his arms toward the lamp in a carriage with untiring perseverance. At twenty months he seems to wish to throw himself into his father's arms, whom he perceives at a second story window of the house, while he himself is in the garden.* If the child could

* The Senses and the Will, pp. 54 *et seq.*

speak and interpret his actions, he would say to us that if he moves his hands in this way toward distant objects, it is because he believes he can grasp them; he appreciates their size and their form, but he is incapable of judging whether they are within his reach or not. The notion of distance does not yet exist in him; perspective is unknown to him; he does not yet know how to project, to exteriorize, so to speak, at the required distance, the images, however clear they may be, of the objects that make an impression upon his eyes.

The observations made upon people born blind, who at least can express what they feel when they see for the first time, throw a great deal of light upon this question. I know that Cheselden is reproached for not having noted with enough exactness the facts which he was the first to discover. But his statement has great value nevertheless, other more exact experimenters having come after him and having established the inability of the blind to recognise immediately, as soon as they begin to see, the third dimension of extent and the distance of objects. "The first time that he saw clearly," Cheselden says of his blind man (he neglects to say how many days it was after the operation), "he had so little appreciation of distances that he imagined that all objects, whatever they were, were in contact with his eyes, 'were touching his eyes,' as he said himself, just as everything he touched was in contact with his skin."* Paul Janet claims that

* See Philosophical Transactions, April, May, June, 1728.

this is only a metaphor, a very natural one in a blind person, who has never had any but tactile impressions. But, fortunately for the empiristic argument, other testimony is more decisive. Such is that of a blind person operated upon at the age of twelve by Éverard Home. "Like most of those that are born blind, this boy could distinguish daylight from artificial light, the brightness of the sun from that of a lamp, before the operation, and he said that it seemed to him that the sun touched his eyes; which was not surprising, the sun manifesting itself to him by the intensity of its light and not by the appearance of its form. But when he had been operated upon once in the left eye, he was not any farther advanced in this respect. When the operator asked him what he saw, he said, 'Your head, and it seems to touch my eyes.' When the right eye had been operated upon, experiments were not begun immediately. But twenty-seven days after the second operation, nearly three months after the first, it seemed to him that the sun and all other objects were still very near him."* Wardrop and Franz have collected facts analogous to this. Wardrop, whose observation is most minute, operated upon a woman forty-six years old who had been blind from birth. On the eighteenth day the patient still finds great difficulty in discovering how far objects are from her; when an object is placed near her eyes, she tries to grasp it, but extends her hand far beyond it, while in other cases she

* Philosophical Transactions, 1807, i, pp. 83-87.

extends her hand a very short distance to grasp objects that are farther away.* We find, then, in this person, though elderly and intelligent, the same awkwardness that we see in the child every day, when he extends his hands at random to grasp what is out of his reach. Franz performed experiments in 1840 in Leipsic with the same result. Several days after the operation that gave him his sight, the patient, seventeen years old, could not distinguish a plane surface from a solid. "A cube and a sphere are placed before him: he declares that he sees a square and a disc. The cube is removed and replaced by a disc of the same dimensions as the sphere: he declares that he sees two discs. Exterior objects seem to him to be so near him that he is sometimes afraid of striking against furniture that is in reality some distance from him. Although he had learned by touch that in the human face the nose is prominent and the eyes sunken, the human face seemed to him as he looked at it to be a plane."† In a very recent observation on a girl of thirteen who had been born blind, it was found that there was at first no appreciation of space, and eight days after the operation it was still very imperfect. "Four or five days after the patient had recovered sight an object was shown her at least thirty metres away. She declared that she could touch it with her hand, and extended her hand to grasp it."‡

* Philosophical Transactions, 1826, iii, pp. 552-554.

† Ibid., etc., 1849, i, pp. 59-69.

‡ Revue philosophique, January, 1889.

We have insisted upon these observations because they are, by analogy, characteristic and convincing from the point of view with which we are concerned. A person born blind is really a child as far as sight is concerned. If, on the one hand, he has to meet with more unfavourable conditions, whether because the operation that he has undergone has given him sight in only one eye, or because his diseased and painful organs do not act as readily or with the same completeness as in a naturally healthy sense, it is evident, on the other hand, that he has some advantages over the child. For a long time he has been collecting a large number of tactile experiences, which can at once, so to speak, guide his vision; besides, the band that covers his eyes is almost never thick or opaque enough to render them absolutely insensible to the action of light. Those whose blindness is owing merely to a lesion of the crystalline lens can even recognise colours, according as they are more or less brilliant or striking; and this perception, although confused, permits them in a certain degree (the coloured object lighting up to a greater or less extent the visual field) to take account of the limits, the dimensions of this object, to judge even if it is very near or far away, the illumination of the eye being more or less intense. The person born blind has the superiority over the child in the education of sight, which his age, his tactile experience, and his developed reason assure him. From what we find in him, then, we have a right to infer what probably takes place

in the child, and to conclude, *a fortiori*, that the latter must experience at least equal difficulties.

There remains to discover how the mental construction of the perception of distances and of the depth of bodies is carried on. The child will show us himself, if we observe him carefully. Why do we see him continually turning objects about in his fingers and feeling of them, as he will of a box, a glass, or a book? Because of a secret need of activity certainly, and for the pleasure of moving his hands; but also, we believe, through curiosity, in order to find out, by the indications of touch, the contours of objects, their nature and peculiarities. And while the touch perceptions are becoming distinct, sight, acting at the same time, receives varied impressions. Different images correspond to different situations of the bodies that are felt and handled, not only by reason of their particular form, but also because of their position in space, as the child holds them near or far from his eyes. A correspondence, an association, is established slowly between the data of the two senses; so that after a number of experiences the child comes to interpret the visual phenomena, and to take them as signs of such and such tactile knowledge.

It is not at the very outset, indeed, that the touch perceptions join the sight perceptions,* and adjust themselves to form the notion of the

* In the third month the little girl observed by Taine "began to feel things with her hands, to move her arms to reach

dimensions and depth of objects in the child's mind. The blind person operated upon by Wardrop, nearly twenty days after the operation, could not yet distinguish with her eyes alone a silver pencil and a large key, although she recognised them perfectly when she touched them. So Cheselden's blind man had to look very attentively at things that he had already handled before he could tell what they were. He was obliged to feel even familiar objects again before establishing clearly a definite association between the visual image and the tactile representation. After forgetting often which was the dog and which the cat, he was ashamed to ask the question again, and taking the cat, which he recognised by touch, he looked at it fixedly for a long time; then placing it on the floor, he said, "Well, pussy, henceforth I shall know you!"

The case is nearly the same for the perception of distances. Here, too, there is an association established between the visual phenomena—greater or less dimensions, outlines more or less defined, colours more or less pronounced—and the reality of the distance. We have some right to suppose that the child does not really acquire the notion of the relative distance of bodies until he can walk, and, being able to measure the distance between objects by traversing it, finds that the tree becomes larger as he approaches it, that the house appears smaller and smaller the farther

objects, beginning to associate blots of colour with tactile and muscular impressions of distance and of form." *De l'Intelligence*, book ii, chap. ii.

he goes from it. But the child can appreciate the variation of sensible images, in its connection with the relative proximity of objects, long before he can walk. He has noticed that the book that is within his reach appears to him in other conditions from the one that he tries in vain to grasp. The child can measure small distances by simply extending his arms, and so begins the long work which will allow him to represent the world of material things to himself, not as a plane surface but as a depth, in which material things are placed in a succession of planes at different distances from the eye.

The visible world, as we can not repeat too often, presents itself to the child at first only as a picture in which an awkward painter has disregarded the laws of perspective, and has not succeeded in producing the illusion of distance. It is only little by little that things draw back, so to speak—locate themselves at different points in space. The distribution of light and shade, the strong relief of the nearer objects, the gray tints that dull the outlines of those farther away, in a word, the visual phenomena, thanks to experience and to habit, become the signs of possible tactile representations; and what is most remarkable—we do not pretend to explain it—these signs are immediately interpreted, transformed even, to the point of disappearing from consciousness, and sight seems in some way to grasp of itself, in the original text, what it really does not perceive except by a translation, by means of the experiences of touch and of loco-

motion. The natural perceptions of sight are reduced to colour and extent of surface; all the rest is acquired. And if we grant the nativists this fact, which, moreover, does not seem controvertible, that the motions of the eyes contribute in small part to the perception of space; if we admit, with Maillet,* that the feeling of the effort of convergence of our eyes (the nearer the object to be seen the greater the convergence) gives us, up to a certain point, a vague notion of distance, it would follow, then, that sight begins by itself, without the aid of touch, the construction of space, but by no means that it can perfect it without that aid.

* Maillet, *Éléments de psychologie de l'homme et de l'enfant*, p. 193.

CHAPTER IV.

HEARING, TASTE, SMELL, AND TOUCH.

I. HEARING.—Temporary deafness of the newborn child : its causes.—First auditory sensations.—Insensible progression and intermediate states.—Sounds, from childhood, excite the nerves more than any other impressions.—Sounds have also, in certain conditions, a moderating power.—Rudiments of the musical sensibility.—Noise for the noise' sake.—Impression produced on the child by the human voice.—Sensations and impressions.—The direction and distance of sound. II. TASTE AND SMELL.—Taste impressions the first to appear.—The tactile sensibility associated with the gustatory sensibility.—Distinction of different tastes.—The taste for sweets the first habit of the child.—Repugnance for new foods.—Natural likes and dislikes.—Resemblance between taste and smell.—The general inutility of sensations of smell retards their development.—Sensations of smell are the weakest of all sensations.—They are of account only when superadded to sensations of taste.—The child is rather inattentive to odours than incapable of perceiving them. III. TOUCH.—Particular character of tactile impressions.—Passive and active touch.—Impressions, sensations, and perceptions.—Thermal impressions.—Does pleasure accompany the first tactile impressions?—Pleasures of active touch.—The muscular sense.—The notion of exteriority.—How the child comes to recognise his body as belonging to himself.—Pain aids him in distinguishing the subject from the object.

I.

THE development of the sense of hearing does not by any means involve the complications, the

delays in muscular adaptation and arrangement, which the sense of sight has presented. Doubtless every child is deaf at first; but this temporary deafness does not last more than a few hours—a few days at most—and, moreover, it results from wholly material causes; so that these physical obstacles once removed, and they are rapidly, the child enters into immediate possession of the sense of hearing in all essential points.

The principal reason for this state of temporary deafness is the absence of air in the tympanum. In order that the child may hear, it is necessary that the liquids that obstructed this cavity during the intra-uterine life should flow out and make room for the atmospheric air; and it is owing to the respiratory motions that this exchange takes place. There is no longer a question of holding, as certain physiologists did in the gala days of the inneity doctrine, that “hereditary, innate air exists,” which would fill the ear of the new-born child.* Several hours at least of respiration seem to be necessary to completely clear the auditory paths. One other cause assists in preventing at first the full play of the operations of hearing: it is the closing of the cavity of the ear, whose walls are so firmly joined together in the beginning that the sound can not penetrate to the tympanum.†

But these material obstacles very soon disap-

* Preyer, *The Senses and the Will*, p. 73.

† It is probable, also, that the ossicles which transmit the vibrations communicated by the membrane of the tympanum

pear, a little sooner in one case, a little later in another, while the individual differences are not very great. Preyer, who has studied the progress of the child's hearing with his usual conscientiousness, declares that it was not until the morning of the fourth day that he knew, from certain signs, that his son's deafness had disappeared. "As long as he was warm and well fed, and in a comfortable position, I had but to clap my hands or to whistle to make his eyes, which were half closed, close completely. As this occurred in the course of the fourth day, when nothing like it had taken place on the third, it seemed certain to me that the tympanum had not begun to act until the fourth day, that it had been inactive up to that time."* But the change comes earlier in other children, and from the second day, sometimes from the first, characteristic motions, such as the winking of the eyes, wrinkling the forehead, moving the arms, show us that the vibrations of the sound waves have penetrated into the canals of the labyrinth as far as the fibre of the auditory nerve, and that the newborn child is sensitive to sound.

To what extent he is thus sensitive, through what stages hearing passes, how auditory acuteness is insensibly developed by exercise, in what order the ear comes to perceive the different qualities of sound, it is almost impossible to

to the fluid contained in the labyrinth are not immediately in a state to act, and that some time is necessary for their movements to be performed regularly.

* See *The Senses and the Will*, pp. 81 *et seq.*

know; the only signs that disclose the auditory sensations to the observer not being of a nature to tell of the shades, the proportions of these sensations, and revealing to us but this one fact in the rough, that the child hears. It is probable that the total deafness of the first days is succeeded by intermediate states until the hearing faculty is perfected; the organ developing and being strengthened little by little, so that it receives sound impressions more and more intense without being wounded by them. What would happen if from the very first day a screech or a shrill whistle, or a resounding roar, could affect the sensibility to the extent that it will affect it later? By hearing too soon the child would run the risk of not hearing at all for the rest of its life. If the noise of a cannon can cause deafness in grown people, how much greater reason is there that sounds too intense, if felt, should threaten to bruise, to injure an organ so delicate and so unexercised; just as too strong a vibration breaks the strings of a harp or a violin. In any case, too precocious an auditory sensibility would present other dangers: it might provoke excessive excitement, even convulsions, perhaps. Nature has wisely protected the child against the shock of too numerous or too violent sensations, in leaving him dull of hearing for a few weeks. This relative deafness of the newborn child, like his semi-blindness, gives the organism time to consolidate, so to speak, so that it may be able to resist later the force and multiplicity of sensations. It is to the child, above all, that these

words of Hartmann can be applied : “ What would become of our poor souls if they had to respond unceasingly to the infinite multitude of excitations constantly in play about us ? ”

From the first days of childhood, however, hearing appears with the characteristics which this sense will keep all through life ; its impressions move the nerves most quickly, and excite most profoundly the inmost emotions of the soul. At every age, as we know, sound far surpasses form, and even colour, as the agent of excitation. There is something penetrating and keen, we can not tell what, in every kind of sound (I do not speak of the human voice alone), that affects us with greater intensity than the most highly coloured and most striking images possibly could. And at the same time, by a singular privilege, if sounds are at all sweet and caressing, or harmonious, they have the virtue of calming, of stilling passions, and of establishing a sort of happy quiet in the soul.

Facts show that the child feels, from these two points of view, the particularly strong action of auditory impressions. The least noise very soon makes the newborn child start. “ During the first week,” says Darwin, “ my little child started and winked his eyes on hearing a noise. When he was sixty-six days old I happened to sneeze near him. He moved quickly, contracted his brows, seemed to be frightened, and cried. For a whole hour he was in what would be called a nervous state in a grown person.” To be sure, the new objects that strike the child’s sight have

also the effect of provoking motions of surprise and starts of fear; nevertheless, as Darwin has also observed, sounds startle the child much more frequently, and, we shall add, much more violently, than do the sensations of sight.

On the other hand, we have all seen the soothing power which the auditory impressions in certain cases and under certain conditions exercise upon the child's sensibility. His cries yield to the sound of his mother's voice; his tears are dried by the songs of his nurse.* And it seems that the æsthetic sense—under the form of a rudimentary taste for music—is aroused more quickly in the case of hearing than in that of the other senses. When one month and a few days old, Tiedemann's son heard the piano for the first time, and seemed delighted by it. Preyer has noticed the progress of this musical sensibility: "The sixth week," he says, "the child became quiet and opened his eyes wide when he heard his mother sing. The eighth week he showed his satisfaction on hearing a piece rendered on the piano by a particularly attentive look, by lively motions of the arms and of the legs, by laughter and smiles. The thirteenth week it became easy to attract the child's attention with single notes, chords, or scales; he became quiet as soon as he heard them, in the midst of the most violent crises, and took on an air of rapt attention.†

* When the child observed by Espinas was one month and two days old, he could be quieted by the songs of his nurse; as soon as she became quieted he began crying again.

† See *The Senses and the Will*, pp. 84 *et seq.*

However, we must not exaggerate the child's musical taste. It is doubtless sweet intonations, humming of songs, that succeed oftenest in calming him. Doubtless, too, he will prefer rhythm, cadence, harmony ; but the sound in itself pleases him, whatever may be its quality ; he likes the noise because it is a noise. As soon as his organs are strong enough to support it, the intensity of the sound is a pleasure to him. What deafens us, and seems loud and brawling, delights him, perhaps because he is accustomed, by his own piercing cries, to the most discordant sounds, but, above all, because every excitation is agreeable to the nascent sensibility, and the stronger it is the more agreeable it is. With children as with savages, there can be no question of taste, which presupposes a work of selection, a reflective judgment, which primitive nature does not permit.

It is no less true, however, that if the child is amused by all noises, he is charmed by harmonious and musical sounds. It is hearing that first arouses in the child a vague sense of order, of regularity, and consequently of beauty. It is hearing, also, that first seems to emancipate his intelligence. We have said that the child, at the end of a few months, recognises familiar persons, their faces, and their physiognomy ; but the auditory impressions have, I believe, the advantage over visual impressions in this respect. When one month old the child observed by Cuignet did not recognise any one by sight ; it mattered little to him who carried him, who took him in their arms ; but he already distinguished his mother's

voice. The verse of the poet should be modified to read :

Incipe, parve puer, *lingua* cognoscere matrem !

The human voice—above all, the mother voice—which is like the appeal of the active intelligence to the dormant intelligence, is perhaps the quickest of all sensible impressions in finding its way to the child's attention. Natural affinities explain this particular power, but we may remark further, that the human voice being the sound that the child has most frequent occasion to hear, he very soon becomes familiar with it. Finally, it is the mother's word that sounds nearest the ear of the newborn child, and penetrates it most sweetly during the long hours passed together.

Some time, moreover, will be required for the impression of the human voice itself to become more than a confused sensation, to become a distinct perception. The child would learn to speak much more rapidly than he does if he were able at the start to distinguish the different articulations. The difficulty in reproducing sounds, which he finds at first, does not result merely from the inexperience of the vocal organ ; it is owing in part to the vagueness, the lack of precision in the first perceptions of hearing, which is at the beginning sensitive above all to the intensity, to the pitch or to the tonality of sounds, but which comes only little by little to distinguish tone and articulation.

Hearing does not at once perceive the distance and direction of sound. Espinas, to be sure, says that he saw a child seven days old raise toward

a person who spoke aloud very near him. But in this case it was easy to recognise the direction of the voice, since the person speaking was only a few steps away, and was directly in front of the child.* If the sound comes from a distance the difficulty is greater, and the child does not overcome it easily, although he is aided, as we all are, by the fact that the organ of hearing is double, and the sound waves, according to their origin and their source, impress one ear more strongly than the other. Darwin's son, in spite of his sensibility to sounds in general, even at the age of four months could not easily recognise the direction of a sound so as to turn his eyes toward its source. We must not forget that in order to find the direction of a sound it is necessary to begin by feeling a need of seeking for it; and the little child is not yet sufficiently dominated by the instinct of causality to have an idea of inquiring into the cause of any noise that he hears.

The case is the same in the perception of distance, which comes only from experience and from reasoning. We judge that a sound that we have heard several times before is near, if it is strong; that it is far away, if it is weak. But it is impossible to demand this appreciation, only approximate at best, of the child, as long as his hearing, on the one hand, is not sensitive enough

* At two months and a half, the little girl observed by Taine recognised manifestly the direction of certain sounds—for instance, hearing the voice of her grandmother, she turned her head toward her.

to discern easily the relative intensity of sounds, and his judgment, on the other hand, is not strong enough to draw a conclusion from the degree of intensity as to the difference in distance. Just as Cheselden's blind man saw objects as though very near his eyes, perhaps in his eyes, so a deaf person who should suddenly receive his hearing would imagine, doubtless, that the sounds he heard were touching his ears.

II.

If we had followed the chronological order in the study of the child's sensations and perceptions, we should have begun with the sense of taste.* Apart from a few vague tactile impressions which have preceded them (and that from the intra-uterine life), the sensations of taste are certainly the first to appear. The sense of taste is formed and ready to act from the time of birth. We should not expect any ulterior development of so simple an organism, since it includes only the tongue, the mucus that covers it, and the nerves whose ramifications are spread out there. At the first contact with a sapid substance, then, the sense acts immediately. And whereas the need of nourishment and the instinctive motions

* "The functions of taste and of smell hold the first place in the animal life; the newborn child makes use of them from the beginning, without groping, without experience; he first smells milk, desires it, and tastes it. These are the first purposes, brought with him on his entrance into the world."—(Maine de Biran, *Fondements de la Psychologie*, part ii, sec. ii.)

of sucking will keep the child at his mother's breast, agreeable impressions of taste will encourage this effort and contribute by a sensible excitation to the accomplishment of an essential function. Without wishing to exaggerate the importance of final causes, it is difficult not to recognise in this co-ordination of different means for a common end the intention of a benevolent and far-seeing Nature.

Not only nourishment, then, but also, we may almost affirm, the first pleasure, the first sensation comes to the child from his mother's breast. This sensation, moreover, is not one exclusively of taste; touch, too, has its part here; the tongue and the lips possess a very keen sensibility to touch. And it is perhaps by pressing the mother's nipple in his mouth that the child acquires also the first confused notion of exteriority.

We should not dare to affirm, however, that the action of sucking, and the gustatory impressions resulting from it, are at the outset accompanied by consciousness. It is by a wholly instinctive impulse that the child moves his head or his lips to get nearer the source of his life, and the continued repetition of an act entirely mechanical to begin with is probably necessary in order that consciousness should appear. But there is no doubt that the child very soon distinguishes the particular taste of the milk with which he is fed from all other tastes.

We frequently see nurslings that can not accustom themselves to a new nurse; and although the impressions of smell, not to speak of the hab-

its of general sensibility, can in part explain this repulsion, it is certain that the sense of taste is the principal cause of it. Just as we notice it if the wine served to us to-day is not the same that we had yesterday, so the child perceives immediately that there has been a change in the milk with which he is fed. I remember with what grieved energy a child that I used to see refused the milk offered him in the bottle if it was not quite so sweet as usual. Sucking being the essential act in which almost the entire life of the newborn child is centred, it is in this circle of impressions that the faculty of comparison between different sensations is developed, and it is here also that the force of habit has its beginning. Indeed, if the child, while a nursling and after the weaning, shows a marked preference for sweets, it is not only a matter of instinct and of innate tastes,* nor because the organism

* We do not hesitate to recognise what there is of the instinctive and innate in the child's liking for a sweet taste, and consequently his liking for milk. There is an old experiment made by Galieno which seems decisive in the case of animals. He chose a newborn goat, one that had not taken suck; he placed it before a row of vessels, all alike, each one filled with a different substance: milk, wine, oil, honey, and meal. The goat smelled each vessel, but chose the one containing the milk. Romanes, who cites this experiment, concludes from it that there can be no doubt as to the hereditary memory or instinct in the goat, and adds that it is probably the same, in part at least, in the case of the child. In support of this hypothesis he cites Professor Küssmaul's experiments, according to which newborn children, even before having taken the breast, "show a preference for sweet tastes. . . . Moisten a child's tongue with a sweet

demands the sugar, so to speak, by a sort of natural appetite ; it is partly habit that determines the preference—the habit of an alimentation always the same, uniformly pleasant and sweet, which will render the transition to another kind of nourishment difficult and painful.

It is to be remarked, indeed, that the child, when once weaned, will almost always show a sort of apprehension and a repugnance, at least transitory, when new foods are offered him. Even those that he will like best when he has tasted them several times he is almost sure to repel at first. Every sensation of taste to which the child is unaccustomed disconcerts him to a far greater degree than the new impressions of sight or of hearing. Preyer found this to be so with his son at the age of a year and a half, and still so at four years. “He shook his head and closed his eyes every time a new dish was offered him ; his face took on an expression of astonishment ; and yet the food was pleasing to him, as he asked for it often after that with an expression of satisfaction.” Habit holds tyrannical sway over the tastes and dislikes of children ; and the proof of this is in the astonishing differences which the sensibility of adults themselves offer, from this point of view ; a dish that nauseates some being, on the contrary, the favourite of others.

solution and he will show satisfaction, but do the same with salt solutions, with vinegar or quinine, and he will make all sorts of faces.” Although we wish to give instinct its due, still we believe that it must take account of habit also.

Still, while admitting that there may be tastes almost indifferent in themselves, and that the habits of alimentation alone make them relished or detested, we do not believe any the less that, naturally and instinctively, the taste of every little child distinguishes between agreeable and disagreeable impressions. The nurse in *Romeo and Juliet* * tells how she had covered her breast with wormwood when she weaned Juliet, and how the child turned from her breast in disgust. But before the weaning, from the very first days, bitter, sour, salt tastes provoke motions of repulsion, expressions of displeasure in the newborn child. Whereas he eagerly sucks a piece of sugar, he forcibly rejects medicine. Later, marked partialities, invincible repugnances will accentuate themselves still further. We have seen a child four years old, usually very docile, who would not yield to any prayer, to any threat, when being urged to eat some green peas. And this instinct of violent repulsion is so powerful that the mere sight of dishes that the child dislikes will sometimes cause a really angry scene; at the least, the child will put his hand before his eyes to escape seeing the food that displeases him. As far as we are concerned, we have never observed the effects of that happy and easy verbal suggestion which Preyer claims to have successfully employed, when, to induce his son to take a certain dish, he simply said, emphatically, "It is good"; and the child, convinced, found it good.

* Act i, scene iv.

Although fancy plays a great part in the impressions of taste, daintiness that might be corrected, habits that might have been moderated, still we shall find a firm foundation derived from "innety" or from heredity, of dislikes or instinctive appetites. Preyer is more correct when he seems to be putting himself in contradiction with himself, and declares that a practical rule should be laid down never to oblige a little child to take a food whose taste does not please him.*

Smell works in collaboration with taste, and these two senses whose organs are such near neighbours, locally speaking, have a great similarity between them.† The olfactory apparatus is also very simple: a membrane covering the inside of the nose and a special nerve spreading out over it. It would seem natural, then, that the development of the sensations of smell should be as rapid, as precocious, as is that of the sensations of taste; and it would probably be so if they were as useful. Utility—that is to say, adaptation to an end which the needs of Nature demand—is the great agent of acceleration in the evolution of functions, as in the development of organs. And that is why the sensations of smell, whose general uselessness in human life is hardly to be

* The Senses and the Will, p. 127.

† There is no certainty that there is any differentiation in the very beginning between the two senses. Perhaps at first there are not both odours and tastes, but *taste-odours*—the odour of milk, for instance, joined to the taste of milk. When a flower is presented to a child for him to smell it he opens his mouth. (See Perez, p. 18.)

doubted, while they are, on the contrary, so important in animals, are so little developed in man, and so slowly developed in the child. The newborn child's indifference to odours results from the same principle as the marvellous power of scent in the case of dogs. Condillac did not trouble himself at all with the natural order of evolution of the sensible faculties, or, in any case, he did not respect it, when, in animating his statue, he made it begin by smelling a rose. Roses and flowers speak only to the child's eyes at first by their shape and form; their perfumes do not affect him. Rousseau saw this. He says, "It is certain that the sense of smell is dull and almost lacking in most children." *

The first reason to give for this, as we have said, is that sensations of smell are the most useless of all sensations. Colours in themselves are useless also, but colours are coexistent with extent; they are received with the forms and contribute consequently to the knowledge of the exterior world. The odorous emanations of things, on the contrary, teach us nothing, or almost nothing of the nature of objects. They float about in the air; they lack foundation, so to speak. Except in the case of food (and we shall see immediately that on this point the rule that we establish admits of an exception), they serve for no more in the satisfaction of material life † than

* *Émile*, book ii. Rousseau, moreover, gives this strange reason for it that smell is the sense of the imagination.

† It is because they are, on the contrary, of the greatest utility in animal life that the sensations of smell are so devel-

they contribute to the development of intelligence and to satisfy curiosity. They are the weakest of all sensible impressions in the child, as they always will be. They will never disturb the sensibility to any great extent, at most they can but caress it, so to speak, when they are agreeable, and offend it slightly in the opposite case. Finally, they are of no value in themselves, and are of account only when added to other impressions; they perfume the flower that we take pleasure in seeing, the fruit that we like to taste.

It is precisely under this last form, as an element added to the impression of taste, that smell affects the child. There is no doubt that what we call an appetizing odour excites the sensibility of the nursling when he is no longer hungry. The sense of smell being so closely connected with the sense of taste that we can not taste anything without smelling it at the same time, the two sets of sensations are intermingled, are confused, and mutually excite each other. It is probable that smell, rather than the remembrance of former impressions, guides and attracts the newborn child when, placed near his mother's breast, he turns quickly to grasp it.*

oped in the carnivorous animals, and especially in the dog. Romanes cites the instance of a dog which he tried to lose on a public promenade one *fête* day. He made a great many turns and detours in his path, then sat down on a bench and waited. When the dog found that his master was no longer at his side, he returned to the place where he had seen him for the last time, and then, finding his scent again, he followed him in all the zigzags he had made until he came up with him.

* Compare Preyer, *The Senses and the Will*, p. 133. "The

Perez tells of children several weeks old who refused to go to a new nurse simply because the odour of her breath or of her person affected them disagreeably.* Finally, smell plays a great part, assuredly, in the dislikes or preferences which children evince for such or such food.

It is important to notice, moreover, that in the case of the little child there is a lack of attention in respect to odours rather than a lack of the power of smelling them. The experiments cited by Preyer prove this beyond a doubt. He says: "Küssmaul has seen that newborn children, even when asleep, show their sensitiveness to odour, if the fumes of *asafoetida*, for instance, are placed under their nose: they quickly shut their eyelids tight, wrinkle up their faces, become restless, move their arms and head, wake up, then fall asleep again when the fumes have passed away." Genzmer has obtained analogous results. To complete these observations Preyer asks that nurses shall come to his assistance, that they shall put some strong-smelling substance either on the outside of the bottle or even on their breast. "Such investigation," he adds, "is very desirable." And he seems to have succeeded already in persuading people to do it, for he speaks of a little girl two days old who obstinately refused the breast when it had been previous-

disinclination of many infants, in the first week, to take cow's milk after they have had the breast must be ascribed to smell rather than to taste, since they sometimes discard the cow's milk without tasting it."

* Perez, p. 38.

ly sprinkled with petroleum. Preyer concludes, nevertheless, as we do, that the olfactory impressions are slow in manifesting themselves clearly. At seventeen months his son could not distinguish odours and tastes, and when hyacinth blossoms were given him to smell, he put them up to his mouth instead of to his nose. Not until the fifteenth month did eau de Cologne give him any pleasure.* And finally, to end with a more important observation, it is only when he is challenged, when odorous substances are placed directly under his nose that the child feels and smells them; he does not seem disposed to look for this sort of sensation himself, and there is not, so to speak, any active spontaneity in the sense of smell.

III.

Touch is presented under the most favourable conditions for a broad and immediate development, and tactile impressions are at the disposal of the child from the start. In the first place, the apparatus is still less complicated than that of smell or of taste, since it is composed simply of nerves ending in the skin. At the same time the tactile sensibility is spread out over the entire surface of the body, although in very different degrees: the tongue, the lips, the hands, and, above all, the fingers, being particularly endowed. Besides, the operation that brings the sense of touch into play is most simple—a mechanical

* Preyer, pp. 131 *et seq.*

contact, a pressure. Finally, there is no doubt that this sense, by an exclusive privilege, has been exercised in a certain measure from the time of the uterine life. On this point De Frarière and the partisans of anterior education are right. The child in his mother's womb has already felt light touches, vague contact; and it is to the confused sensations, to the reactions that are excited, either by the limbs of the child, one striking against the other, or by a thrust from without, that we must attribute in part the motions that reveal the life of the foetus.

We may affirm, then, that the child is in possession of the sense of touch from birth, at least in an elementary form, and in purely passive operations. Touch acts in two very different ways: first, as a simple susceptibility which is aroused by exterior contact; second, and it is then, above all, that it acquires its importance as an active organ, when the motions of the body come to add their quota of special sensations to the impressions that belong properly to touch.

Nowhere is it easier to distinguish the natural advance of progression which determines the phenomena relating to the senses: first, purely subjective impressions, which give place to muscular contractions; in the second place, sensations of pleasure or of pain; finally, veritable perceptions, when the subject is no longer affected simply in himself, and when the distinction, which knowledge of things presupposes, is made between the sentient subject and the object perceived.

All is reduced in the beginning to nervous excitations, having, as their result, not an intellectual notion, nor perhaps immediately, an agreeable or disagreeable sensation, but simply reflex actions and motions without consciousness. We cite, as examples, the motions of sucking, which may be excited by merely touching the end of the tongue or the lips, the motions produced in the eyelids if the nose is tickled, the motions of the legs if the sole of the foot is touched, etc. Darwin says: "On the seventh day I touched the sole of my son's foot with a piece of paper; he quickly drew up his foot, and at the same time crooked his toes as a much older child does when being tickled." It would be sufficient proof of the sensitiveness to touch of very young children to have seen one while being baptized.

It is true that in this last case, the day of baptism, when the cold water moistens the child's forehead, the sense of touch does not act exclusively as the sense of contact, of pressure; it acts as the thermal sense, which temperature, heat and cold, affects very quickly. When the child comes forth from the warm prison in which he has been confined for nine months into the free air, he feels a sudden coldness which produces sneezing among other reflex motions. The need of warmth and the aversion to cold, supposing even that suffering and enjoyment do not result at first, cause different reactions in the child according as they are thwarted or satisfied, either a feeble stretching of the whole body, which happens when the child is in a warm bath or in a

well-warmed bed, or crispations and contortions in the case of the contact of cold water.

It is difficult to say with certainty whether pleasure or pain accompanies these first impressions of the organism or not. The observations on this point seem to be contradictory. Preyer tells of having put a finger or a piece of ivory in the mouth of a child whose head was hardly born; he began to suck, opened his eyes wide, and showed by his expression that the sensations were very agreeable. On the other hand, it is possible that the compression undergone by the child during the passage through the neck of the uterus may have been painful. Preyer goes on to say that he heard a child cry twice when its head only was born, and that the expression of the face during this period of half birth was that of great discomfort.*

According to this, the child only half born would have felt pleasure or pain. Nothing is less certain, and the cries interpreted by Preyer as expressive signs of suffering might well be only automatic motions. The child allows himself to be handled by the nurse with a dull tranquillity that would lead us to believe him to be in a state of complete insensibility, a sort of natural anæsthesia. In any case, Nature observes here, as elsewhere, the law of moderation, or of the least intensity of the first sensations. The child just born is less sensitive to painful contacts than is the adult. With his soft, tender flesh,

* Preyer, p. 97.

and his fine, delicate skin, it would seem that the least touch ought to excite extraordinary flutterings of the sensibility. It is not so at all, and benevolent Nature has wisely dulled and deadened the effect of the first impressions of contact. We must not allow ourselves to be deceived by appearances, by the force and frequency of the child's cries, which are almost always disproportionate to the real extent of the sensation felt.

However that may be, if not on the first day, at least at the end of a few weeks, the sensibility, properly speaking, in so far as it is the principle of pleasure and of pain, shows itself with respect to tactile impressions, when they are mere tactile impressions, or when they concern also the sense of temperature. The child cries in his cradle because he is uncomfortable. He cries when being washed if the water is too cold, if the towel or the hand is too harsh. He cries, too, if his swaddling band is too tight, or if a wrinkle in the cloth wounds his delicate skin. He refuses certain foods, not because their taste displeases him, but because they are not warm enough for him. Any one who has assisted at one of these terrible washing scenes, so to speak, the stamping and violent resistance which this daily event in the child's life often causes, has surely no doubt as to the cutaneous sensibility existing in the child.

All observers agree in recognising the existence of disagreeable tactile impressions in children a few weeks old, which, Perez says, result in making them cry, screw up their faces, move their arms, fidget, strike their faces with their

hands. On the other hand, Perez believes he can state that he has not found a trace of tactile pleasure in children less than two months old.* The reason for this, we believe, is that pain betrays itself more easily than pleasure. We have no right to conclude from the fact that agreeable sensations, caused by the gentle pressure of the mother's breast, by the touch of a caressing hand or of a soft fabric, do not manifest themselves in the child, that therefore these sensations are not produced; it is only that the outward expression of them is lacking. It can not be disputed that pain finds means of expressing itself sooner than does pleasure, and it is easy to understand the reason for this priority. The expression of pain is really an expression of a need and of a necessity, because pain, abnormal, though frequent, results from disordered functions, compromises life or health, and consequently demands help. Pleasure, on the contrary, corresponding to a healthy state of the organs, to a regular development of the faculties, does not aim with the same energy at outward manifestation. No inconvenience results from its remaining concealed; and the expression of pleasure is, if I may say so, an expression of luxury which the child can dispense with for some time.

It is active touch, above all, that will cause keen and often repeated pleasure. But the passive impressions of the epidermis are enough in themselves to produce agreeable sensations. The

* Perez, p. 38.

attraction of a little child for his mother or his nurse is not only the effect of his need for nourishment; it results also, in small part at least, from the pleasure derived from a warm, gentle contact. Preyer mentions a child seven days old whose sleep was never troubled by a loud noise, but whom the touch of his mother's face awakened immediately.

In the development of active touch the child will not only feel sensations of comfort, his pleasure will rise to delight; and we come now to one of the richest sources of agreeable sensations in childhood. When the child puts every object within reach into his mouth, when he sucks any substance whatever and presses it between his lips, we must not see in it merely a reminiscence of the act of nursing, an illusion of duped gluttony, nor should we believe, with Preyer, that if he persists in sucking the finger held out to him, it is because he hopes in his ingenuousness that the finger will decide to provide him with milk; it is simply that he enjoys touching, feeling with his lips everything that can give him occasion to exercise at once his nerves and his muscles. And what joy it will be to him when he can use his hands and his fingers in turning over and over in a hundred different ways the same plaything or object, whatever it may be, not only because his intellectual curiosity will be satisfied, but because this exercise of the sense of touch is in itself agreeable to him!

The sense of touch under this new form is but an annex of what modern psychology rightly dis-

tinguishes by the name of "muscular sense." The muscles, so to speak, move the organs of touch. They permit the hand to move about the body it is touching; they give to the fingers that flexibility, that suppleness which they need in order to pass over the different sides of a book, the angles or edges of a square or a round object. In a word, the sense of touch becomes complicated by means of the muscles; it becomes a collection of special and immediate sensations and of motions giving place to other resultant sensations, and also to veritable perceptions. It is then, above all, that touch becomes really active, and that, sensible to pressure, to weight, to the resistance of material objects, it prepares the way for the acquisition of the notion of exteriority.

This acquisition is slow, however, and involves a series of gropings. We must not forget that the notion of the objective, of the non-ego, presupposes that of the subjective, of the ego; and some time is necessary for the child to succeed in this act of consciousness apparently so simple, by which he places himself in opposition to all exterior objects. Without doubt the new-born child can not immediately distinguish his own body from other bodies. In the confusion of his first sensations his feet, which he likes so well to touch and feel, his hand, which he puts in his mouth in spite of the different impressions which would result from the double sensation experienced in this case, are not clearly distinguished by him from all the other objects that

he has occasion to grasp. Romanes says, "The child a year old does not know his own organism in so far as it is part of himself, or, more correctly, in so far as it is a part having special relations with his sensations." Preyer has remarked that his son, when more than a year old, bit his own arm as though it were a strange body; we may say that he still had less consciousness of this member as belonging to his own person than had Buffon's parrot, which began by saying to himself, "Give me your paw," and which afterward yielded to his own demand by putting his foot into his mouth exactly as he would have given it to any one else who had asked it of him in the same way.*

Preyer has made a great many observations on this point: "Before he can be in a condition to recognise the parts of his own body which he could touch and see as belonging to himself, the child must pass through a great many experiences. . . . Vierordt thinks that the distinction of general feeling from the sensations that refer to the outside world exists from the third month. My observations do not permit me to adopt this opinion. . . . In the ninth month the child still manipulates his feet with great ardour and puts his toes in his mouth as though they were a new plaything. Even in the nineteenth month the idea of what does and what does not form a part of the body is not clear. The child had lost one of his shoes. I said to him, 'Give me the shoe.'

* Romanes, *Mental Evolution in Man*.

He bent over, seized the shoe and gave it to me. The child was standing in the room, and I said to him, 'Give me your foot,' meaning that he should hold it out for me to put his shoe on again; he grasped his foot with both hands and tried for some time to seize it and hold it out to me, as he had done in the case of the shoe." *

The senses are not, in the beginning, properly speaking, the organs of the perception of the exterior world. The exterior world does not exist yet for the child. His first sensations and perceptions are neither subjective nor objective; they are simply impressions, or representations which float in the air, so to speak, and which the child does not localize. Pain, perhaps, will teach him to distinguish between subject and object before the comparison of tactile and visual perceptions can accomplish it. The localization of pain, however, is not produced immediately. Houzeau says: "Newborn animals are capable of localizing their pains. It is not so with the child. Egger adds that when Émile was fourteen months old he scratched his finger; he cried, but did not show his finger nor put the other hand upon it. He fell on his nose a few days before, and the blood gushed forth without his knowing, apparently at least, where the seat of the trouble was." †

In passing his hand over his body, in giving himself up to all the little experiments that he tries on his head and on his limbs, the child gains

* The Development of the Intellect, p. 190. † Egger, p. 26.

little by little the idea of the form and extent of his own body, but yet without knowing, perhaps, that the body is his. It is useless to talk of a sort of vital sense "which would give us consciousness of the diffusion of our material being, which would suggest to us in a certain measure the idea of a region where our heart beats, of another where our brain thinks and reflects."* We do not know where our heart is until anatomy teaches us; and the little child would be greatly puzzled, no doubt, if asked to tell where the seat of his thought lies. But what he can learn of himself, aided by sight and by touch, is that it is his body, his flesh that suffers, is troubled by pain in illness, that is burned or shivers with the cold; or, inversely, that takes delight in the touch of a gentle, caressing hand. It is then that the general feeling of the self begins, an indivisible and indistinct self, to be sure, for which there is as yet no question of considering the body as exterior to the soul. And, this general feeling once formed, thanks to the localizations of the sensibility oftener than to visual or tactile perception of the form and of the resistance of the different material parts of his being, the child is henceforth in a condition to recognise, by looking at objects, by touching them, and by feeling of them, what is distinct from himself and outside of, exterior to his own being.

* Mailliet, *Éléments de Psychologie de l'Homme et de l'Enfant*, p. 199.

CHAPTER V.

THE FIRST EMOTIONS AND THEIR EXPRESSION.

I. Pleasure balances pain.—The disagreeable impressions of the senses.—The organic functions.—Sensations of discomfort caused by hunger, by hinderance to motion, by the need of sleep.—The teething crisis.—Weaning, and its sadness.—Correlative pleasures.—The simplest sensations, sources of pleasure. II. The most complex phenomena of the sensibility.—Little passions.—Gluttony.—Egoistic emotions.—Fear.—Is it innate or acquired?—The fear of the new, the unknown.—The fear of darkness.—The part played by surprise in the child's fears.—Analogies in the observations made on animals.—Different forms of fear.—Fear, an emotion proceeding from the intelligence and the imagination.—General apprehension of a possible evil. III. Transition from selfish to affectionate emotions.—Instinctive tendency to love.—Relative spontaneity of sympathy.—The child's affection called forth by the parent's affection for him.—Characteristics of the child's egoism.—The child's sympathy for animals.—Contagion of feelings. IV. The expression of emotions.—The child's power of expression.—Smiles and laughter.—The purely automatic character of the first smiles.—Date of the appearance of the smile.—Different causes of the expressive smile.—Influence of general dispositions of mind and body.—Tears.—Date of the first tears.—Their different significations.—Other expressive signs of the child.

I.

THE child's life, like all human life, is a mixture of pleasure and of pain, and if the balance

seems to lean to the side of pain at first, the equilibrium will soon re-establish itself; toward the second year, when the work of teething is over, it will incline to the side of pleasure.

Let us lay aside the question of deciding whether the child begins life by an agreeable or disagreeable impression. Bouillier, in his book entitled *Du Plaisir et de la Douleur*, affirms, principally for metaphysical reasons, that pleasure should precede, if only for an imperceptible instant, the appearance of pain.* We do not believe that this order of pre-eminence and of succession is the necessary law of sensibility, pain being, whatever may be said about it, as positive as pleasure. However it may be, the question is determined in one way or another, in the intra-uterine life, and the child has not waited till birth to suffer and enjoy, to feel vague comfort or infinitesimal pains.

Let us consider first the pains. We shall not return to those resulting from the exercise of the senses.† Let us notice only that in the begin-

* Every pain having as its cause a stopping, an arresting of our activity, an obstacle of some sort to the different principles of action of our being, we must conclude, contrary to Leibnitz and to Kant, that the first state of our nature is not one of pain, but of pleasure (*Du Plaisir et de la Douleur*, p. 101). Leibnitz, on the contrary, believed that imperceptible pains or discomforts were the necessary condition of pleasure: "Without these semi-pains," he said, "there would be no pleasure, and no means of perceiving that something aids us and relieves us by removing the obstacles that prevent us from being comfortable." (*Œuvres philosophiques*, edition Erdmann, p. 248.)

† See chapters iii and iv.

ning all sense impressions, excepting the taste of milk and of warmth, are disagreeable to the child. What will soon be a source of pleasure, sight, and hearing, is at the beginning only a source of suffering. The nerves, in their delicacy, can not endure as yet either light or noise. And what is no less remarkable is that in a second period, when the sensations have acquired some consistency, all the visual and auditory impressions, or nearly all, will please the child, because they will all call into exercise organs henceforth strengthened and fortified. Time will be necessary for the establishment of a natural selection in forms, colours, and sounds, the two categories of the agreeable and the disagreeable, in order that the child, at first bewitched by everything bright, everything that makes a noise, may distinguish between a hideous gaily coloured Punch and an artistic doll of well-combined shades, between the noise of a rattle and the melody of the piano.

The impressions of the five senses, moreover, when not pleasant, are disagreeable rather than really painful. Localized as they are in one part of the body, they have not a re-echoing in the organism deep enough to result in pain. We ought to except the sensations of touch, at any rate the thermal sensations. The child is very sensitive to cold.* He has been spoiled by the warm temperature of his mother's womb, and has

* The temperature sense perhaps does not exist immediately, since the child is in a uniform temperature during the intra-uterine life. But the variations to which he is exposed as soon

difficulty in becoming acclimated to the free air ; if he makes a scene while being washed, it is less the water than the coldness of the water that he fears.* There is no doubt that the exposure to intense cold would cause him real suffering, for he might die in consequence.

A second series of pains and of sufferings consists of those resulting from organic, nutritive, and respiratory functions, and from the needs corresponding to these functions. Of all the little miseries of childhood, there is none that tries the sensibility of the suckling more than an insufficient, poorly regulated, or in any way vitiated alimentation. I saw one of my sons shed his first tears when he was four months and a half old ; the cause was a very prosaic one : his nurse had eaten too many French beans ! The case is cited of a child three months old whose mother nursed him immediately after having had a violent fit of anger ; the child became as pale as death, after he had nursed, and the result was a fit of convulsions in the right side of the body and paralysis of the left side. Hunger is the first need felt by the child ; if it is not regularly satisfied the discomfort that results causes cries and tears in the suckling ; and if this suffering is repeated too often, it will, perhaps, cause a nervous and irritable temperament for life. Compare the dis-

as he is born develop very quickly the sensation of heat and cold.

* The use of cold water, so extolled in our day, does not agree with very young children (Dr. d'Ammon, *Livre d'Or de la jeune Femme*, p. 155).

positions of children that are well nourished and of those poorly fed : the former are quiet, gentle, and contented, the latter uneasy and restless. It is no exaggeration to say that some of the defects of the matured character of man have sprung from the breast of an irregular or sickly nurse. A good lactation is not only a condition of health, it is also a principle of a good disposition. Notice, moreover, that hunger and thirst appear more frequently in their periodic returns, and demand satisfaction oftener during the first months. As Preyer has pointed out, the smaller the stomach, the oftener it becomes empty ; the more it can hold, the longer the interval between the moments when nourishment is needed, and the rarer is hunger.* At first the needs of Nature seem to demand that the child shall be fed every two hours ; at three months, the time between repasts may be three or four hours ; it will continue to increase, and little by little the child will free himself from the servitude that kept him so constantly at his mother's breast during the first weeks.

The sensations caused by insufficient or impure air, the oppression, the suffocation resulting from difficulties in the circulation of the blood, do not merit particular attention in the case of the child. But the sensations, particularly keen in the first period, resulting from the muscular sense and from the need of motion, must be considered. When the child cries in his cradle, it is

* The Senses and the Will, p. 154.

not always hunger that besets him; it is his clothes that annoy him; his swaddling band, perhaps, binds him too tightly. The sensibility of the epidermis, doubtless, plays a part in these impressions of discomfort.* What would be only a slight touch to an adult may be a painful contact to the child. When we think we are caressing him gently with our hand, we are unsuspectingly wounding and bruising his delicate skin. But it is from hinderances to the liberty of his movements, above all, that the child suffers. Bound like a mummy in his swaddling clothes, he can not stretch his limbs nor exercise his muscles; and to the torture of a painful compression is added the discomfort of impeded action.

It is true that if being deprived of motion is a cause of chagrin to the child, action, in its turn, however limited in extent, opens up a new source of discomfort. I refer to the sensation of fatigue, which accompanies almost immediately the nervous excitations of the senses or the exercise of the muscles. To escape from this, the child keeps falling asleep. With the limited strength at his disposal, the bounds of possible effort are quickly reached and passed. After crying or nursing, the child is tired and goes to sleep. But when he is too much excited to sleep, he shows very plainly that he suffers. Nothing is more unhappy than a child that needs sleep and can not

* To be sure, this sensibility does not show itself immediately, and it is certain that in the first days the sensibility to touch is hardly developed.

sleep. De Varigny, Preyer's French translator, says, in a note in his translation, that he has often been struck by the folly of children when they want to go to sleep. "Often," he says, "they grunt and cry for a quarter of an hour; it seems as though it would be very much more simple to go to sleep without so many ceremonies." That would be more simple, assuredly; but the child has no more power than the adult to command sleep, and we all know how painful this state of insomnia is when, the more we seek rest, the more it seems to flee from us.

The child's weakness betrays itself continually in the fatigue, of which he gives proofs every instant, either by a state of somnolence or by cries followed suddenly by sleep. And there is, doubtless, a disagreeable impression corresponding to this sensation of fatigue and exhaustion. The child's power of action is still so limited that even pleasure soon tires him. Axel, at the age of two months, after having listened for a few minutes to the sound of a piano, slept six hours without awakening, which had never happened before.* Mobility, changeableness, with which the child is so often reproached, results often from his weakness; each one of his functions having only a very limited provision of strength at its disposal, and this being soon exhausted, he is obliged to pass quickly from one occupation to another to exercise his different faculties, one after the other.

* The Senses and the Will, p. 160.

In finishing this sketch of the pains that are the lot of the child, wholly physical pains, moreover, in which the intelligence, the moral sensibility have no part, there remains but to describe the crises of teething and of weaning. But these are medical rather than psychological questions. We shall borrow a few facts, however, from an observer of childhood, to show how deeply the work of teething troubles the sensibility. "The child becomes restless. . . . Sometimes he utters sharp, sudden cries and then becomes quiet immediately. . . . His sleep is often interrupted by starts of fright. . . . One sees that his gums hurt him, for he puts everything that comes his way into his mouth, and bites eagerly at the first object he can grasp. In a second period, on the contrary, he avoids taking objects into his mouth, and cries if he happens to bite anything inadvertently. His colour quickly comes and goes. He is disturbed ; if the nurse is holding him, he shows a desire to be laid on the bed ; he is hardly settled there before he demands to return to his nurse or his mother. Nothing pleases him. He seems to be tormented by a confused feeling resembling fear, which does not leave him a moment of rest." *

We should not touch upon weaning, which interests hygienists above all, if this important event in the child's life did not cause an emotion of a wholly new kind to appear, that of sadness. If weaning is premature, if it is sudden, if it is

* D'Ammon, *Livre d'Or de la jeune Femme*, p. 182.

not seconded by the natural progress of the organism, itself desiring a new alimentation, it not only can cause the child to decline, but can throw him into a sort of moral despondency, which has all the characteristics of sadness and of regret, sadness and regret for the first habit broken.

What we have said of the child's discomforts and suffering, excuses us almost from establishing the contrary—that is to say, from enumerating the pleasures that come to counterbalance them. Pleasure and pain are really correlative. They emanate from the same principle, and there could not be sensibility for bad without, at the same time, a sensibility for good. It is, then, from progressive and measured exercise of the organs of the senses, it is from the satisfaction of organic needs that the child's first pleasures will come. During the first weeks they will result almost wholly from the appeasing of hunger, from the comforts of lactation. Balzac has put these words into the mouth of a young mother. "This little being knows absolutely nothing but his mother's breast. He loves it with all his strength; he thinks of nothing but this fountain of life; he comes to it and goes away to sleep; he awakes only to return to it." Pleasure for the child will result, furthermore, from the comfort that the bath in which he is plunged brings to his whole body, and also from the agreeable sensations which a soft moderate light causes. The pleasures of hearing will be joined to these later, and also those of touch. We must

not forget that in the first exercise of the child's muscles and nerves there are sources of pleasure that the adult does not suspect, because they are in his case, so to speak, exhausted, under the influence of repetition and of habit. Think of all that these little agreeable sensations must represent—whether impressions felt in the first airing, the brightness of day, the blue sky which a blind person, a few days after the operation that gave him his sight, called the most beautiful thing in the world, or the sensation of the pure fresh air, striking the child's head for the first time. And, likewise, when the child has become familiar with external objects, when he has overcome the first feeling of surprise and of fear which the appearance of everything new causes, is it not certain that even the simplest perceptions, to which later he will be indifferent, interest him, and that in this world of real things, when his every glance is a discovery, he feels, if not clear and distinct pleasure, at least a vague contentment. People do not understand why Preyer claims that for children of the first age pleasure results rather from the absence of disagreeable conditions than from the presence of positively agreeable conditions. From the first day the suckling experiences a positive pleasure every time he nurses. And after some time, when the muscular activity can exercise itself, when the child can stretch and move his limbs, when he can utter sounds, when he can feel objects, all these movements will charm and delight him—pleasures, already keen, while awaiting those that the joy of the first steps

holds in reserve for him, the day when he can walk.*

We may conclude, then, that, with the exception of the first few weeks, there is, in the first period of life, as at every age, a balance, an equal mixture of good and bad. Only, as we have already said, the expression is more prompt, more decided, in the case of discomfort than in that of comfort. "When their sensations are agreeable," said Rousseau, even in his day, "children enjoy them in silence"; † but this assertion is too absolute, for the child that feels pleasure knows how to say so in his own language; he prattles, gesticulates, and smiles. It has been falsely claimed that the explanations of the first motions and of the first symptoms of vitality should be sought in some uneasiness, that the first vocal utterances, for instance, depend only on suffering.‡ No, the child has motions of pleasure also, and at a little more advanced age, flutterings of joy, little cries, too, as a prattling of contentment and of satisfaction. If the painful states of his sensibility have a more marked tendency to manifest themselves, it is because they demand relief and help; and they give thus to the very little child the appearance of being more unhappy than he really is.

II.

The pleasures and pains that we have just been enumerating are connected either with the

* The Senses and the Will, p. 143. † *Émile*, Book I.

‡ Souriau, *Esthétique du mouvement*.

organs of sense or with their organic functions, and are localized in different parts of the body. They correspond, moreover, it should not be necessary to say, to as many desires and aversions, as many tastes and dislikes—the pleasure and the pain being but the conscious phenomena which reveal the inclinations, the innate needs. They constitute what might be called “the elements of sensibility,” just as the particular, separate, successive perceptions are the elements of intelligence. Is it possible, then, to point out in the child sensible phenomena of a more complex order, resulting, not immediately and directly, from the muscular or nervous organism, but from a grouping, an association of different elements—that is to say, from sensations already felt, from images and remembrances; and even to note veritable feelings, which, although dependent upon material pleasures already felt, witness, nevertheless, their virtuality and their own energy?

There can be no doubt as to the answer to this question: The affective states of childhood present to us the complete series of the phenomena of the sensibility—sensations, as we have seen, and also, as we are going to show, emotions, even little passions.

It is not too much to affirm that the need for nourishment soon ceases to be simply an instinctive need, and that, excited by the remembrance of satisfaction already experienced, it becomes a passion, with its characteristic of a fixed idea, of a tyrannical and exclusive domination. At the

end of a few months, doubtless, the nascent faculties will balance and counterbalance each other. But in the beginning the child is merely a little monomaniac of gluttony, referring everything to the one action of sucking, and falling asleep as soon as he is satisfied. "His first love is that of a gastronomist."* Later, he will allow himself to be diverted from his ruling thought, but in the first months nothing, not even a toy when shown him, nor a loud noise sounding in his ears, can turn him aside from his animal desire for food. "Even from the ninth to the tenth month," says Preyer, "nourishment and everything concerning it comprises the greatest interest for the child who, with sparkling eyes, holds out his arms toward his food as long as he is not satisfied." And that is why he puts everything he can grasp into his mouth, sucks his finger or his nurse's finger—in fine, tastes everything he touches. Nothing is so curious as this mania of the child. We have seen a baby a few months old move his lips and open his mouth on hearing us drumming on the glass of a window near him; one might say that he was trying to lay hold of the noise. And something of this habit will remain in the kiss, which is perhaps only a recollection of the motion of the lips moving forward to grasp the mother's nipple.

Gluttony is the first passion to appear. Doubt-

* A correspondent of Perez, speaking of a child two months old, wrote: "He is a perfect little beast, voracious to the last extreme. . . . I never should have believed that a child could be such an absolute animal without any instinct but gluttony."

less it will not show itself in all its force except in the child two or three years old, who has been spoiled by dainties; but the child at the breast is not exempt. It is certain that the nursing baby often demands the breast when he is not hungry. And the proof that the characteristics of a passionate need already exist, abridged, to be sure, is that the emotions that usually come in the train of passion, anger, jealousy, find here first occasion to exercise themselves.* The child is angry with his nurse if, for any reason, her breast does not furnish his usual ration of milk. And Tiedemann says that his son showed great discontent when one day, in fun, another child was placed at his mother's breast; he struggled and tried to remove the intruder.

It is natural that the personal emotions should appear first—those that are caused by egoistic aversions to suffering or by the desire for pleasure. The most characteristic of all the child's emotions is fear.

The question is to find out whether fear is instinctive and innate, if it precedes the experience of danger. Assuredly, the greater part of the child's fears correspond to suffering already felt. He has experienced pain very early in life; he fears its approach and its return. And it is to be noted that in certain cases, when exposed to a real danger, he is not aroused, because ignorant and unconscious of it. The child's fearlessness

* We speak elsewhere of the child's anger and jealousy. (See Chapter XIII.)

is oftenest but the lack of foresight. A child that has never been struck, for instance, does not understand the signification of threats, and is not frightened by them. You advance toward him, with hand raised to strike him, and he will answer you with a smile. He knows only your caresses; he does not guess the import of your angry gesture; he is like a little dog that receives the switch with which you are going to strike him, for the first time, with joyful leaps and gambols.

But if the child has smiles for real dangers sometimes, he has tears also for imaginary perils. In other words, the remembrance of a pain already felt is not always necessary to the child's feeling of fear.* And the proof of this is that he will show a keen fear of things that are absolutely inoffensive. Whether by the influence of heredity, or from the feeling of weakness, although he has had no previous experience, the little child shows natural spontaneous apprehensions, and these under two forms—the fear of what is new and unknown, and the fear of darkness.†

We ought, in the case of childhood, to reverse the old saying to read, "Everything new is ugly."

* "It is altogether wrong to maintain that a child has no fear unless it has been taught him." (*The Senses and the Will*, p. 167.)

† "Fear," says Dr. Sikorski, "is an innate feeling; it appears very early before the child has had reason to feel afraid. Little children feel a panical fright at the sight of a cat or a dog approaching them in the most unconcerned way."

Everything new and unfamiliar makes the child start and cry. At the sight of an unfamiliar face he clings, crying, to his nurse. And it is really only the novelty of the impression that frightens him; for in a few days he will become familiar enough with the stranger, to whom he to-day refuses to extend his hand, to throw himself upon his neck. So the dog and the cat, which will soon be the favoured objects of the child's tenderness, cause at first insurmountable terrors. A simple change in the costume of his mother or father makes him cry. And that is why a little girl four months old, spoken of by Preyer, began to cry when her mother approached her with a large hat on, and smiled as soon as the hat was removed. These are cases of misoneism, of that neophobia which modern science studies,* which is found in the adult, but which is, above all, the characteristic of the first period of life. Everything unexpected, unforeseen, is unbearable to the child and causes either fear or, later, anger. One of my sons when four and a half years old would get into a veritable rage every time I spoke to him in the patois of my country; the unusual language irritated him to an extraordinary degree.

Astonishment in the case of the child is synonymous with fear as it will be later with admiration. Surprise and fright are one and the same thing to him. Darwin says that at the age of four months his son regarded all the loud and

* *Revue scientifique* for November 1, 1884.

strange noises which he was in the habit of hearing as good jokes ; but one day his father began to snore loudly, a noise that the child had never heard until then ; he became serious immediately and burst into tears. About the same time Darwin walked up to him backward and stopped suddenly. The child seemed greatly surprised and was about to cry when his father turned around ; his face relaxed immediately into a smile.

Another very characteristic form of childish fear is the fear of darkness. Whence comes this terror of night, which, moreover, is not found in children alone ? Rousseau says, "Night naturally frightens men and sometimes animals."* It comes at first, as Rousseau has also pointed out, from ignorance of the things that surround us and of what is going on about us.† The child, not being able to exercise the sense of real sight, peoples the darkness with phantoms, with fantastic visions. All the frightful things of which his little imagination, too often excited by his nurse's tales, can conceive, spring up in the darkness.‡ A child who was asked why he did not like to be in a dark place answered, "I don't like the

* Locke is of a contrary opinion : "If children were left to their own inspirations, they would not be more frightened in darkness than in daylight." (Some Thoughts on Education, § 139.)

† Rousseau, *Émile*, Book II.

‡ Dr. Sikorski says that his children have never been afraid of the dark, because they have never heard tales to make them afraid.

chimney-sweeps!" And this instance proves that the child does not have to have his head crammed with foolish stories to be frightened by darkness. It is not only supernatural beings that his imagination calls up; it is real beings, thieves, chimney-sweeps! Where he does not see anything he imagines everything. Add to that the natural repugnance for black which is generally found by observers of childhood. Preyer tells of a child seventeen months old who showed a repugnance even for his mother when he saw her dressed in mourning.* Tiedemann's son, in the fifth month, turned away from people in black with an evident feeling of repugnance. "Black, the colour of darkness, denotes in itself something disagreeable." There remains for us to add, finally, that solitude is even more terrible to the child than darkness. Even when the child is not alone he believes, if it is dark, that he is alone. His eyes can no longer rest on the persons or on the things that are the familiar supports of his weakness. He feels himself to be abandoned, deserted. Such is the meaning of the reflection of the child that said to one of his companions, "Do not let us go there; there is no one there; some one might hurt us!"

Is it necessary to call in heredity to explain the instinctive apprehensions of the first years, as do Preyer and Darwin? And to admit that

* Mme. Necker de Saussure claims, however, that the fear of black is a simple effect of habit. "In Africa," she says, "the little negroes are afraid of white people." (*Éducation progressive*, Book II, chap. iv.)

the fears of the child, when completely independent of experience, are the hereditary effects of real dangers and of barbarous superstitions dating from the epoch of savage life? This would be exaggerating the case and seeking uselessly in a prehistoric past for an explanation that one has, so to speak, right under one's nose. In the two classes of fears that we have examined—those caused by the surprise of a new impression, and those caused by the absence of light—the question is really one of visionary terrors, the emptiness of which is shown by experience. The experience of our ancestors has, then, nothing to do with it. Darwin, it is true, seems to lay stress upon other facts, and particularly upon the following example: When his son was only two years and three months old he took him to the zoölogical garden; the child took great pleasure in looking at the animals that resembled those he knew—deer and antelopes, all the birds, and even the ostriches; but he showed great fear of the large animals that he saw in the cages. He often said afterward that he would like to go to the zoölogical garden again but not to see the “*beasts in houses.*” And Darwin concludes that this fear would be inexplicable if we did not consider it as the remembrance of the bloody struggles which our ancestors had to carry on against the wild beasts in the primitive life. The phenomenon, however, seems to us to be much more simple. Darwin says himself that the child was never frightened at the sight of animals whose forms were familiar to him and which were not shut

up. If the animals imprisoned in their cages caused another impression, it was a simple effect of surprise. By their forms, by their dimensions, perhaps by their motions, if they were leaping behind the bars, above all, by the fact that they were inclosed "in their houses," as the child expressed it, the lion and the tiger astonished, and consequently frightened, his imagination.

It is not in an unconscious recollection of the life of the ancestors, it is in the very nature of the child that we must look for the origin of his fears. We must not forget that it is real dangers that frighten him least; and if he has never been harshly treated, he even seems to pass through an initial period characterized by the absence of fear.* But at the end of a few months he has felt suffering, he has vaguely discovered his weakness. And in his limited experience of evil, by a natural generalization, he suspects danger everywhere, like a sick person whose aching body dreads in advance every motion and every contact. He feels that there is a danger everywhere, behind the things that he can not understand, because they do not fit in with his experience. The observations collected by Romanes† in his interesting studies on the intelligence of animals throw much light on this question; they prove that dogs, for instance, do not fear this or that

* This is Preyer's opinion. In the *Senses and the Will*, p. 165, he says: "The avoidance of occasions of pain prolongs the period that is marked by unconsciousness of fear, whereas the multiplication of such occasions shortens the period."

† Romanes, *Mental Evolution in Animals*.

except as they are ignorant of the cause. A dog that was afraid of thunder was very much terrified one day when he heard a rumbling like thunder produced by throwing apples on the floor of the garret; he seemed to understand the cause of the noise as soon as he was taken to the garret, and became as quiet and happy as ever. Another dog had a habit of playing with dry bones. One day Romanes attached a fine thread, which could hardly be seen, to one of the bones, and while the dog was playing with it he drew it slowly toward him; the dog recoiled in terror from the bone, which seemed to be moving of its own accord. So skittish horses show fright as long as the cause of the noise that frightens them remains unknown and invisible to them. It is the same with the child. When in the presence of all these things around him, of which he has no idea, these sounding objects, these forms, these movements, whose causes he does not divine, he is naturally a prey to vague fears. He is just what we should be if chance should cast us suddenly into an unexplored country before strange objects and strange beings—suspicious, always on the *qui vive*, disposed to see imaginary enemies behind every bush, fearing a new danger at every turn in the road.

The chapter on fear would be a long one if we tried to go into minute details and examine all the forms that this emotion assumes, from the terror, full of anguish, which the little child feels for a few moments in the presence of a conflagration, for instance, to timidity, that diffuse fear,

which paralyzes all the movements of the child three or four years old, and which is, as it were, the residuum of the fears of the first period. There would be many kinds to distinguish; for instance, the fear of falling, which is found not only in the child learning to walk, but which appears even in the nursing baby when he hugs himself close to his nurse's breast to keep from sliding to the floor, a sort of childish agoraphobia, a characteristic fear of space.* According to Preyer, the child has also an instinctive fear of the immensity of the ocean. He says: "When in his twenty-first month my son showed all the symptoms of fear when his nurse took him to the beach. He began to fret, even when the water was quiet, the wind calm, and the tide low." We must see there, assuredly, only the effect of a sensation of surprise before the sight of a great sheet of water. In the same way the fear of thunder in the child is only the result of the unexpected impression of a loud noise whose cause is unknown. And the proof of this is that one sees children two years old who, when they have become familiar with the phenomenon, laugh at the claps of thunder and amuse them-

* Compare what Tiedemann says on this point: "The child was in his fifth month. One could see that he tried to use his hands to keep himself in place. If one put him down suddenly, he tried to steady himself from falling by using his hands. It was very disagreeable to him to be lifted very high. He could have had no idea of a fall. So the fear of it was nothing but a purely mechanical impression, like those that one feels when near a precipice, and a little analogous to vertigo."

selves by imitating with their hands the zigzag flashes of lightning.

What is more important than classifying the different kinds of fear is to determine the fact that fear marks a real step forward in the development of the child's sensibility. Sully says, rightly, that it is the most elementary form of emotion, pure and simple—that is to say, of feeling caused directly by the mental activity. There is something here besides a sensation produced immediately by a present object; there is an act of intelligence and of imagination, and a sort of vague induction. The child that has suffered from an injury is henceforth disposed not only to fear the recurrence of the same injury, but to take for granted the possibility of evils of the same sort. Locke said: "I think we may observe that, when children are first born, all objects of sight that do not hurt the eyes are indifferent to them; and they are no more afraid of a black-amoor or a lion than of a nurse or a cat.* What is it, then, that afterward, in certain mixtures of shape and colour, comes to affright them? Nothing but the apprehension of harm that accompanies those things," † apprehension, this idea of a possible harm, that steps into even the most instinctive fright and gives to fear, however ridiculous, however foolish it may be, an intellectual if not an intelligent character.

* This is true, we believe, only in the first days of life at most, when the child is still almost indifferent to outward perceptions.

† Locke, *Some Thoughts Concerning Education*.

Fear, in the totality of its manifestations, is, like the appetite of hunger, only one of the forms of the instinct of conservation, one of the means that Nature employs in order to preserve the individual, one of the instruments of the struggle for existence. It is exclusively a personal, egotistical feeling, like the instinct of ownership and self-love; and we have now to find out how the sensibility, which has already passed from sensations to personal emotions, rises by a much more difficult transition to the affectionate emotions.

III.

It can not be denied that the affectionate feelings of the child have their origin in selfishness. The first affections arise from the remembrance of little personal pleasures which the nurse or the mother have given the child.* The little child likes only what gives him pleasure or amuses him, and that is why an inanimate object—a toy, a doll, a favourite animal, a dog, or a cat—has perhaps the same rank in his affections that his father or mother enjoy. Doubtless the love for others, even in its childish form,

* Compare the case of animals. A little dog that I observed showed a great affection for the servant whose duty it was to feed him. But the dog was taken sick, and could not eat; he was not hungry. From this moment he paid no attention whatever to the servant, and preferred to seek the company of the other people in the house, who were contented to pet him. It is the same with the child; affection is first inspired by the grateful remembrance of the material attentions he has received.

is far from being only a grouping of agreeable impressions, concentrated by the association of ideas about the same person; just as judgment and reasoning should not be confounded with a collection of sensations. But these agreeable impressions are the occasions, the circumstances, that incite the need of loving, and guide it in one direction or the other. The analysis, to explain the tender sympathy which the child shows for its mother, may well enumerate the apparent and, so to speak, exterior elements of the filial feeling—the recognition of services rendered, the remembrance of caresses received, the whole series of impressions that have pleased the utilitarian instinct, or bewitched the senses of the child. But there is something more which the analysis does not reach; there is a natural something, the instinctive tendency to love, which springs from the depths of the soul. In other words, we can explain the reasons that attach the child's heart to such and such a person, just as, when studying the growth of a climbing plant, we might tell why (from circumstances of proximity) it has fastened its tendrils on one bush rather than on another; we can easily explain why the child loves his mother or his nurse, but we can not tell why he loves at all.

It has often been said that the child learns to love by feeling that he is being loved, by seeing the love of others for each other. Affection then would be, above all, an act of return, of imitation. We shall not contradict this; we can not insist too strongly upon what is social, of the family,

and, consequently, what is acquired in the development of individual sensibility. As Guyau puts it, "It is by dint of receiving that the heart ends in giving."* It is from the collaboration of many, from contact and correlation with other personalities already formed, that the power of each individual to love springs. A child deprived of love, cast by the fatality of his birth into the midst of barrenness and coldness, would run great risk of not knowing the sympathetic and affectionate emotions. It is not absolutely by a *moto proprio*, it is by a sort of response from within to the appeal without that the sensibility, like the intelligence, frees itself from the shackles of the unconscious.

But the relative spontaneity of sympathy in the child is none the less an established fact, and it shows itself at first by the need that the child feels for the sympathy of others. The child demands from his parents not only material care, external attentions, to make him happy; he demands their love also. Darwin has written these touching lines in his notes on his daughter Annie, who died at the age of ten: "When her gaiety became too boisterous a single look on my part, not of anger (I thank God that I almost never looked at her so), but of a lack of sympathy, changed her expression for several minutes. Her affectionate disposition showed itself when she was a very little child, in that she never remained really quiet in her bed, except when she could touch her mother."

* Guyau, *Éducation et hérédité*, p. 63.

The need of being loved does not exist without a certain faculty for loving; and on this point, too, we shall call upon the testimony of Darwin. He says that sympathy was clearly shown in his son at the age of six months and eleven days; every time that his nurse pretended to cry he assumed an air of sadness, characterized by the lowering of the corners of his little mouth. But not until he was a little more than a year old did he begin to express his affections by spontaneous actions—for instance, by embracing his nurse over and over when she returned after a long absence.

We can not agree with the view of childhood given by Naville, a philosopher, who, on most points, is better informed. "Little children," he says, "are perfect egotists. Let us not reproach them for it. How could they feel sympathy? They do not know that there are joys and sufferings in the world other than their own. The people about them are at first only things to them. They have not yet divined souls behind these bodies that move under their very eyes. Even when a mother bends over the cradle of her little child with a face full of love she is to him only a moving thing. He will see her shed tears many times before understanding that she suffers. And only when he does understand this will the dawn of sympathy and of the moral life break forth in his heart."* It would be hard to bring together more errors into a few lines, and

* *Revue philosophique*, 1881, vol. ii, p. 654.

this half page would be enough to show how the psychology of the child is still groping and wandering; how, after a hundred years, Rousseau could still say, in his own country, "We know nothing of childhood." In the first place, the child is not a "perfect egotist," since real egotism presupposes the calculated preference which we give to our own interests. The child is incapable of calculation, and so, if he is an egotist at all, he is but an egotist without knowing it. His amiable, innocent egotism is but the instinctive search for pleasure. But what is rash above all things is to pretend that people are only things in the child's eyes, when, on the contrary, he considers and treats inanimate things as though they were persons—the doll, for instance, which he loves, which he personifies to the point of loving it as a sister, and pitying it for its imaginary woes.* And, finally, we can not agree that children are as slow as Naville thinks in interpreting the feelings of others, in understanding, for instance, the meaning of tears. There is a force of signification in the natural expression of pain which can not long escape the child's divining intelligence.

There is no doubt, moreover, that egotism is mingled with disinterested affection in the af-

* Compare Preyer in *The Senses and the Will*, pp. 150, 151. "When figures of all sorts—e. g., human forms—were cut out of paper with scissors for the amusement of my child, he would often weep if a paper figure was in danger, through hasty cutting, of losing an arm or a foot (twenty-seventh month). A like account has been given me of a little girl."

fectionate emotions of the child. But will not this always be the case? Is it not very rare to meet a sentiment of affection absolutely free from personal preoccupation? So the child loves his mother for his own sake more than for hers; he loves her in the interest of his own comfort, which the mother assures by her care and caresses.* Tiedemann's son, when almost a year old, became attached, little by little, to his sister and to a little dog, to both of which he had been perfectly indifferent up to that time. He did not want any one to harm either the one or the other, for both began to serve as a pastime in his play. So, later, friendship will be, in its beginnings, but the pleasure of playing with companions. The egotistic impression is always the starting point, just as at the root of every abstract and general idea there is always a sense impression or a particular image.

Let us notice, moreover, that the child's affections are guided by this particular sentiment called sympathy, in the proper sense of the word

* Lactation, with its accompanying caresses, is the most important agent in the development of sentiment. It is from "this physiological source of the connection of the mother with her child," according to Fonssagrives's expression (*Leçons d'hygiène infantile*, Paris, 1882), that the future feeling of human solidarity and altruism spring. As Morel has said (*Maladies mentales*, 1860, p. 561): "The first maternal education, thanks to a multitude of careful attentions, of instinctively ingenious caresses, thanks to a long moral incubation, if we may express it so, brings us to the spiritual life, as we have been brought to the physical life, and renders us twice the sons of our mothers." (Dr. Sikorski, *Revue philosophique*, vol. xix, p. 252.)

—that is to say, the tendency to reproduce, to reflect, so to speak, the feelings of others. It is doubtless for this reason that animals are the child's best friends. He naturally sympathizes with beings that resemble him in so many ways, in which he finds needs analogous to his own, the same desire for nourishment, the same tendency to movement, the same fondness for caresses. To resemble one another is to love one another. The animal, which suffers, cries, feels hunger, disobeys, and is scolded, recalls to the child at every turn the events of his own life. This is why he seeks its company, and is particularly charmed by the stories that tell him of animals. Sympathy is not a blind instinct; it is a feeling—that is, the intellectual representations are involved, and are even the necessary condition; the representation at least of thoughts, of emotions, which we have experienced in ourselves more or less vaguely, and traces of which we recognise by certain signs in other beings. Let us not expect the child, then, to sympathize with grown people in general; their actions, their feelings, their ideas, are too far above his range for him to comprehend them. Nothing brings them near to him. This is not the case with parents that act like children with their children, and show the child by their unceasing solicitude that they feel all that he feels, suffer what he suffers, that they share his amusements and his troubles. The child that has divined from his mother's glance that she shares his suffering will be prepared, by this close communion of his soul with another soul, to sym-

pathize, in his turn, with his mother's emotions. He will be sad when he sees her weep, gay when she is gay. The force of sympathy, the contagion of the feelings which it engenders, though powerful at every period of life, is particularly remarkable in children, as is proved, for instance, toward the fourth or fifth year, by those fits of foolish laughter, or, on the contrary, of violent indignation, which are communicated from one to another through a whole band of urchins.

IV.

We shall now study the expressive signs of the different emotions that we have just been describing—emotions that are known to us as long as the child does not speak, only by these expressive signs themselves. Even at his time Charles Bell wrote: "Children express some emotions with an extraordinary force; indeed, as we advance in age, some of our expressions no longer spring from the pure, unmixed source from which they gushed during childhood."* The child, as no one will dispute, possesses the faculty of expression in a very high degree. Everything in his soul flashes forth in the movements of his supple body, in his immoderate gesticulation, in his frank, open physiognomy. No calculation comes as yet to disturb the natural order which associates with every inner emotion an exterior sign. It is the eyes, above all, that may be called

* Anatomy of Expression.

the mirror of the child's soul. The man will learn to hide his feelings, to bury in the depths of his being all that he wishes to conceal. Ardent passions will escape often behind an impassable mask, or will betray themselves only by imperceptible signs. The child, on the other hand, does not want to hold back anything that he feels, and he could not if he would, the organs of expression being not yet mastered by the will. The dualism that is established in the grown man, with autonomous will and moral faculties on the one side and a manageable disciplined body on the other, is hardly even outlined in the child. His little soul shines forth in every muscle. It will restrain itself, recover itself, in the adult, but in the first years of life it pours itself forth with a prodigious exuberance; and no counter-order of will, no inhibition of the faculties of reflection, arrests the flight, the excessive prodigality of the need for expression found in the nascent soul, which, so to speak, is as yet one with the body. There is almost always a disproportion between the expressive faculties and the impressions felt; but while in the adult the expression falls short of the reality, in childhood it exceeds it. The child's embraces are in excess of his love; he cries more than he suffers; he laughs more than he is amused; and when he has learned to talk, he will talk more than he thinks.

It is not from the first day, moreover, that cries, smiles, tears, or gestures acquire significance. Before becoming expressive motions they are simply impulsive motions. We have estab-

lished this fact in the case of the cries,* and we shall now show that it is true of the smile, of the laugh, and of tears. The same motion may be in turn a pure reflex, an automatic action, an involuntary sign, finally, the voluntary expression of such or such a state of the soul. An attentive observer could doubtless note quite perceptible differences in the movement, according as it is passing through one or another of these different phases of its evolution; he would find, for instance, that the child's cries, that express nothing, do not resemble those that, on the contrary, express a sensation, an emotion, hunger, anger; that the smile is not always the same either, and that it is transfigured, even materially, when it corresponds to a feeling. But these shades are hard to appreciate, and parents often make the mistake of being too disposed to see signs and significant things where there is still nothing but pure automatism.

Poets, and even philosophers, know how to embellish the subject. We have already cited Victor Hugo's verses on the sweet smile of the child. Paul Janet, in a charming page, greets in the first smile the beginning of the moral life, "the hatching of a reasonable soul."† There is

* See Chapter II.

† Paul Janet, *Lá Famille*, p. 149. "We might say that the child's moral life begins with the first smile—that smile so sweet to the parent's eyes, so indifferent to strangers, but so worthy of the attention and admiration of the observer and the philosopher, who discover in it in a way the hatching of a reasonable soul."

nothing really inexact in all this, neither in the enthusiasm of the poet, nor in the philosopher's interpretation. But in order to have the right of attributing either this æsthetic charm or this high moral significance to the smile, it is necessary to choose the time, to wait until the smile has become, by a slow evolution, what it was not in the beginning. In the prosiness of facts the smile is at first only an automatic motion or a reflex action. It does not escape the general law that unconscious life precedes the intelligent life, and that moral significance is added little by little to acts that are at first purely mechanical. When the triumphant mother cries toward the second or third month, "He has smiled," or "She has laughed," she ought to be told that behind this first smile there is no intention, perhaps no feeling even, of pleasure. This first smile is a body without a soul. It is only a grimace, produced by chance, or because the mechanism of the face wished it thus. There is the outward appearance of a smile, the mask of a smile, so to speak, but the reality is not there. Darwin calls attention to this. "Those who take care of little children," he says, "know well that it is hard to tell whether certain motions of the mouth express anything or not, to know whether they are smiling or not."* The proof that smiling and laughing may be owing to purely physical causes

* Compare Preyer, *The Senses and the Will*, p. 294. "The first smiling is the movement most often misunderstood. . . . It is no more the case with the child than with the adult that a mere contortion of the mouth fulfils the idea of a smile. There

that have nothing to do with the sensibility is the fact that tickling produces bursts of immoderate laughter in the child, together with a convulsion of his whole body. "How long the first sign of love, the smile, is in appearing!" writes Guyau. "People believe that it is natural, spontaneous; who knows how many accumulated efforts of perseverance, of will, have been necessary in order that the child might bring to light this marvelous smile, which is already the rough draft of disinterestedness? Follow the child's moral life, reflected upon his face; you will see this first sketch, little by little, clothed in a thousand shades, a thousand new colours; but how slowly! No picture of Raphael's ever cost more effort!"*

The expressive smile, which not only opens the mouth but which betrays either the child's pleasures or his first affections, which gives brilliance to the eyes and lights up the whole face, does not appear immediately. It presupposes, as do tears also, a gradual development, and before the real smile there are, as it were, outlines and sketches which are half smiles, quarter smiles.

According to Darwin, the smile would be but a diminutive laugh, a weakened laugh, the vestige, the remainder in the child of the habit acquired by our ancestors during a long line of generations, of showing their joy by laughing. There

is required for this either a feeling of satisfaction or an idea of an agreeable sort. Both must be strong enough to occasion an excitement of the facial nerves."

* Guyau, *Éducation et hérédité*, p. 63.

seems, however, to be more than a difference of degree between a smile and a laugh, since they do not express the same feelings. The smile is the sign of a moderate emotion of pleasure or of an affectionate feeling; the laugh corresponds to an intense joy, and, in the adult, to more complicated causes. The laugh, indeed, does not proceed from the same principles in the child and in the man any more than do tears; and if psychologists have some trouble in analyzing the origins of the human laugh, it is surely much easier to explain the child's laugh, which is always, or almost always, the simple expression of joyous emotions of the soul. Children laugh oftener and more easily than grown people. Their plays are often merely a long burst of laughter. The most trivial event, the slightest motive suffices to excite these indefatigable peals of laughter. It is to be remarked, however, that the categories of laughable things are less numerous at this period. The child hardly knows the laugh of derision nor the laugh produced by surprise, by a sharp and sudden contrast, which would incline him rather to cry.

It is when the child is about six weeks old that the laugh appears, according to Mme. Necker de Saussure; the smile, earlier. Darwin observed the first real smile in the case of two children on the forty-fifth day; in another, a little earlier. But these are only rare, fleeting appearances, and at two months old the smile has not yet become a habit.

The smile in its first manifestations is, so to

speak, concentrated in itself ; it is not directed toward any one. The child smiles with pleasure after having been gorged with milk, in the state of comfort in which his finished repast leaves him. Preyer says : " On the tenth day of his life I saw my child while he was asleep, after having just nursed his fill, put his mouth exactly into the form of smiling. The dimples in his cheeks became distinct, and the expression of countenance was, in spite of the closed eyes, strikingly lovely." * Later, the child smiles at his mother, later still at the objects that amuse him, at his playthings. And these smiles are not all alike. The expression of the child, smiling at his mother toward the third month, is easily distinguished by the direction of his glance from that of the child that smiles without thinking of it, simply because his nourishment satisfies him. If we could follow and note exactly the progressive shades of the smile, we should find briefly a history of the child's mind : first, the simple material satisfaction of the little animal that has been well fed ; later, the feeling of gratitude which the nursing baby has for whoever nurses, cares for, and caresses him ; later still, and in a higher degree, sympathetic affection, love, disinterested tenderness ; finally, when the intelligence is awakened, the shrewd penetrating sense that seizes upon the amusing connections of things, the entertaining witticisms of conversation.

The smile, like the laugh, does not involve

* The Senses and the Will, p. 295.

merely a special cause that calls it forth at the moment when it is produced; it is connected with the health, with the general state of the body, and of the mind. Marcel was ill for a time, and the smile disappeared entirely; it did not return until his physical strength began to be built up again. In the child, perhaps, much more than in the man, the smile and the laugh depend upon the general conditions of the whole organism. How can we explain, except by a general state of comfort and contentment, these innumerable laughs of the child, that never end and do not seem to have any definite cause?

The question reduces itself to an investigation as to whether the smile comes spontaneously to the child's lips or whether it has to be called forth, whether it is but an imitation, or at the least a response to another smile. Guyau does not hesitate on this point, and says, "It is by dint of seeing smiles that the child smiles." This statement is too absolute. Doubtless little children smile oftener if they have an example before them—*ridentibus arrident* . . . Excited by the sound of a caressing voice and by the sight of a smiling face, the nursing baby flutters, moves his hands, seems to wish to raise himself, and at the same time his whole face is lighted up with joy. But toward the fourth or fifth month, according to my personal observations, the child begins to show signs of the initiative in his smile. Marcel at this age, when lying in his cradle, was very much pleased by a curtain with red flowers on it; he talked to it in his own language, he smiled

at it. The same child at six months did not wait for me to smile before smiling himself; he took the lead, and smiled first. Imitation, that great means of education, undoubtedly exercises its influence in the development of the expressive signs, as in all the other parts of the intellectual evolution. But we believe, nevertheless, that the smile, hereditary or innate, is a natural grace of the child. It is with the smile as with all the rest; first, reflection, so to speak, reaction, and response; afterward, personal initiative. Even if he lived with sombre, melancholy parents, in the midst of frowning faces, the child would smile, less often perhaps, but still he would enliven this society of saddened and unfortunate people with his gay and charming smile.

When the smile has once become a habit the child will never unlearn it, not even the most sickly, the most miserable child; for there will always be, even in the midst of the greatest suffering, bright gleams of comfort, of relative pleasure, which will permit a smile to dawn upon his lips as the sun breaks across the clouds. On the other hand, there is always enough tenderness in the child's heart for a disinterested smile to be developed, the expression of pure sympathy, freed from all remembrance of agreeable sensations. At four months Marcel smiled at me almost as much as at his mother, notwithstanding the fact that the sight of me did not recall any pleasures to him.

The laugh under its different forms—the moderate laugh, bursts of laughter, immoderate

laughter—is in one sense the adult smile, in so far as the smile is simply a sign of pleasure. It is owing to a lack of strength if the smile of the very young child when he is satisfied and happy does not break forth into noisy laughter. Even in the child of two months the smile is accompanied by sounds that seem to prepare the way for a laugh: "A sort of little bleating," Darwin says, and he adds that when the child he observed was one hundred and thirteen days old these sounds changed their character; they became more broken, more jerky, as in the sob. This, Darwin says, was the beginning of laughter.

It is the same with tears as with smiling and laughing; here, too, there is a gradual development. Darwin says that a certain practice is necessary for weeping as well as for the acquisition of the ordinary motions of the body, such as those of walking, for instance.* Before being the expression of pain, tears are a purely material phenomenon, devoid of any moral significance. Darwin says, in addition, that every time the periorcular muscles contract greatly to protect the eyes, in compressing the veins the lachrymal secretion becomes more active, often to such an extent that tears flow down the cheeks. This phenomenon appears under the influence of the most opposite emotions, *as well as in the absence*

* It is to be remarked, moreover, that children differ greatly in the matter of tears, rare in some, frequent in others. Dr. Sikorski has minutely analyzed the causes of what he calls *pleurnicherie*: the sicknesses, bad care, conditions of birth, etc. (See *Revue philosophique*, vol. xix, pp. 248 *et seq.*)

of all emotion. Purely physical impressions that do not arouse the sensibility may produce tears. Paring an onion will cause even an adult to weep. But tears are soon associated with the cries that the child utters when he suffers, when he complains, and they become the sign of physical suffering before being, at a higher stage of evolution, the natural language of affliction and of moral grief.

It is important to note, moreover, that tears do not accompany the first cries of the newborn child. The date of the first tears varies greatly with different children. Darwin made experiments on his children and the children of his friends. In some the eyes were not moistened by tears until the third or fourth month; in others tears appeared toward the end of the third week. Preyer claims that his own observations would point to a more prompt appearance of tears, and he protests in the name of German children at least, who show greater precocity, "I have seen tears flow from the eyes as early as the twenty-third day in my boy."*

These contradictions are not of great importance, since they bear only on a question of days, or of weeks at most. What is undoubtedly established from now on is the order of the evolution of the causes that determine tears from the days when tears have acquired significance: First, physical suffering; later, emotions of another

* The Senses and the Will, p. 308. "What Darwin reports—that usually babes do not shed tears before they are two or four months old—is not true of German children in general."

order—anger, caprice, chagrin; finally, moral grief. And it is to be noticed that in the life of the adult the last stage will continue almost alone. In man at least, if not in woman, tears will become less and less frequent, and will never be occasioned by physical suffering; moral pain alone will bring tears to their eyes.*

Let us not neglect to show, moreover, that a certain number of movements of the face are joined to tears to express the painful states of the soul, just as laughing is not only a movement of the lips, but is completed by a number of other signs. Darwin, following in the footsteps of others—of Lebrun, for instance—has described minutely the physiognomy of a weeping child: Knitting of the brows, lowering the corners of the mouth, etc. The weeping child cries aloud, and the two English verbs *to weep* and *to cry* are synonymous. The knitting of the brows, the wrinkles that crease his forehead, are produced independently and do not always accompany cries and tears. Preyer observed these motions from the second day. A mother saw her baby a few days old knitting his brows and said, "He is thinking of grave matters." No, these motions, like all the rest, do not represent a real moral situation until after some time, and they have not at first any psychic causes.

Let us add, finally, that tears, like laughter,

* The laugh, Darwin says, resembles tears, which do not flow in the case of the adult except under the influence of moral grief, while in the child they are occasioned by any suffering, physical or otherwise, as well as by fright and anger.

even at the period when they have become expressive signs, are not necessarily the expression of suffering. The proof that there is often in the laugh only a superabundance of life, the discharge of the excess of nervous force, is in the fact that sometimes when children begin to laugh, a meaningless circumstance—a nothing, really—will cause them to pass from laughing to crying, and *vice versa*. Tears sometimes accompany contentment, satisfaction. The child sometimes sheds a few tears while nursing. In the adult, also, there are tears of joy.*

Cries then, together with smiles and tears, are far from exhausting the natural language of sensibility. In moments of joy or of keen pleasure the whole body is in motion; the legs move, the child claps his hands; later, he will leap with joy. When angry the child becomes red, when he is frightened very pale. It is hardly probable that the child's cheeks are coloured by a blush for the same reason as in the case of the adult. Darwin says that the intellectual faculties of children are not sufficiently developed to permit them to blush.† To say nothing of the intellectual faculties, it is certain that the feelings that most fre-

* If the laugh is peculiar to man, it is not the case with tears. Darwin says, "It is known that the Indian elephant weeps sometimes." Sir J. E. Tennent, in describing the elephants that he saw captured and imprisoned at Ceylon, expresses himself thus: "Some remained motionless, crouched on the ground without showing their suffering except by the tears that flowed incessantly."

† "The blush," Darwin says, "is the most human of all expressions. We can cause a laugh by tickling the skin, tears or

quently cause a blush—shame, wounds to self-love—are rare in the child. Darwin, however, mentions two little girls who blushed at the age of two or three years, and a child four years old who blushed when reproved for any fault.

The multiplicity of the affective states in the child could not be better established than by the study of his physiognomy. Humility or courage, the feeling of weakness or of strength, surprise, astonishment, admiration, are strongly depicted on his face or are revealed in his posture. What could be more expressive than the pout, the protrusion of the lips, that sign of bad humour? A whole book might be written on this subject, a whole gallery of photographs taken and collected (like those that have already been attempted, of crying children), in which might be preserved that which is so fleeting, which by its incessant changing defies even the quickest observation, the most continued attention, which, finally, bears witness even by this very fact to one of the principal characteristics of childish sensibility—the perpetual inconstancy of its light and capricious emotions.

frowns by giving a blow; but we can not occasion a blush by any physical means. The mind must be impressed.”

CHAPTER VI.

MEMORY BEFORE AND AFTER THE ACQUISITION OF LANGUAGE.

- I. Opinions of Rousseau and Madame Campan.—How far back do our first remembrances date?—Why do we remember nothing of our first years?—Development of the child's memory.—The continuity, or at least the repetition of perceptions is necessary to establish the remembrance of them.—Consequently, the remembrance of accidental facts is effaced.—The multiplicity of impressions, and, above all, the absence of co-ordination, causes the disappearance of the first remembrances.—The idea of the self, the necessary rallying point, does not exist as yet.—The inability to localize remembrances in time and space.—The passive character of the child's memory.—The presence of things necessary to arouse memory.—The impersonal memory of the child and the organic memory.—In one sense, memory precedes consciousness.—Recognition.—The association of ideas and language. II. The further development of memory.—The power of acquisition of the child's memory.—Physiological reasons.—Psychological reasons.—In the adult, the overburdened condition of the memory hinders the acquisition of new ideas.—Other characteristics of the child's memory.—The child has not learned to forget.—The remembrances of childhood are particularly vivid; in different forms of amnesia they are the last to disappear.—Faults of childish memory: it is literal and mechanical.—The memory of imbe-

ciles.—Inequality and different forms of memory.—Importance of memory.

I.

“MEMORY is not developed until the age of three years,” wrote Mme. Campan.* J. J. Rousseau, more absolute still, declared that children, not being capable of judgment, have no real memory.†

What seems to be unusual and false in these estimations may be easily explained if we consider, not what the two authors seem to say, but what they really mean to say. If Rousseau seems to deny the child memory, he means only the memory of ideas—the adult memory, which is capable of following and recognising all the threads of a long reasoning. He was the first to affirm that children remember sounds, forms, sensations, which amounts to saying that they remember everything that they can perceive and feel, abstract ideas not being yet within their reach.

As to Mme. Campan’s statement, it depends on this fact of general observation, namely, that the adult does not remember the first years of his life. “In my earliest remembrances, which go back, if I mistake not, to my fifth or sixth year”—this is the opening of the *Mémoires d’un*

* Mme. Campan, *De l’Education*, Book III, chap. i.

† Rousseau, *Émile*, Book II: “Although memory and reasoning are two essentially different faculties, still one does not really develop without the other. Before the age of reason the child does not receive ideas, but images.”

Enfant, by Mme. Michelet. "My first recollections," says Darwin, "date from the age of four years and several months."*

According to other testimonies, memory sometimes goes back a little further. One person of thirty-five whom I questioned on this subject told me that she remembered with remarkable precision as to details certain sights that she had witnessed when she was three years old: a baptismal ceremony in the village, a noisy fair in Paris. One of my sons remembers a visit which he made his grandfather; he remembers having seen him, when ill, stretched at length in his invalid's chair. He died a few months later, when the child was only two years old. Pierre Loti claims to have had remembrances dating from as early an age. He says: "I remember as though it were yesterday the evening on which I suddenly discovered how to run and jump; I was excited to the point of falling by the deliciously new amusement, though I had walked for some time. This must have been at the beginning of my second year."†

But most memories seem to have begun at a more advanced age. I have pried into my own

* Rousseau says the same: "I do not know anything about what I did before the age of five or six. I do not know how I learned to read." (*Confessions*, Book I.)

† Pierre Loti, *Le Rôman d'un enfant*, p. 4. Perez tells us that he retains the terrifying remembrance of an ignorant and coarse nurse who, when he was only two years old, held him out of the window a moment, and pretended that she was going to throw him down. (*L'Enfant de trois à sept ans*, p. 3.)

recollections in vain; the only fact that rises from the dark abyss in which my first years are buried dates from my sixth year: it is the proclamation of the republic of 1848. I still hear, as though in a dream, the serious tones of a friend of my father's who came, while we were all at table, to announce the news of the fall of Louis Philippe. I still see the restless groups of people in the evening discussing the situation for hours on the promenade of the little city in which I lived.

There is no doubt but that different causes vary for each individual, the date at which his past begins: First, the particular dispositions, a more or less marked precocity, but, above all, the circumstances, the character of certain incidents that the child has witnessed, which have surprised him and have struck him by their novelty or their importance, projecting them, so to speak, causing them to stand out, on the customary course of life. One will remember a catastrophe, a great misfortune, even less than that, a bad fall experienced at the time of the first steps, while the ordinary events of a regular and monotonous life will be forgotten.

But with these variations, which are easily explained, the general fact stands, nevertheless: there is a limit beyond which we do not remember anything.* A veil of obscuration hides our first years from us. It would seem natural that the recollections of the beginnings of our life

* "It is customary generally to assume that the memory of adults does not extend further back than to the fourth year of life." (Preyer, *The Development of the Intellect*, p. 9.)

should be confused, but the truth is, they do not exist at all. It is true that we always find some difficulty in *recomposing*, so to speak, in bringing back the past by means of memory, even in the case of maturity or of youth. In even the most faithful adult memory there are always gaps, partial forgetfulness. But when it is a question of our very first years there is a total amnesia analogous to that which follows intoxication or to that which is caused by certain diseases, an amnesia, however, which is natural and normal. Nothing of what we have seen or felt, of our joys and our first sorrows, remains in our consciousness. Not one ray of remembrance lights up these years which are lost to us—lost, at least, to our memory—and during which nothing recalls to us the fact that we have lived.

This is the first problem we have to solve in the history of the evolution of the memory. We must not think to explain it by answering that if we do not remember anything it is because nothing has happened and that wherever consciousness is wanting memory loses its power. There is no doubt but that consciousness is awakened very soon, that the child feels emotions—emotions of fear, of astonishment, of joy—which, although arising from slight causes, have nevertheless their force and their vividness. And, to take but one example, how does it happen that we have no remembrance of an action that seems to interest all the active forces of the child's being—that of the first step, the first walk? The essential conditions generally associated with the power of re-

membering—keen sensation, attention—are realized in this case. The child learning to walk is visibly attentive, and when he takes possession of space for the first time he is manifestly delighted. How comes it, then, that this important event of the first period of our lives leaves not the slightest durable imprint in our memory?

The best way to explain the facts is to begin by defining them well. Let us begin, then, by showing that the memory of the little child acts in its own way, and then consider under what conditions it acts. From the very first months the nursling learns to recognise his mother's face, the faces of the people who care for him and caress him. In this recognition, which sometimes withstands an absence of several weeks, the power of memory shows itself. Perez cites an instance of a child (a year old, to be sure) who was taken back to his home after a month's absence. As soon as he saw a good old servant coming toward him, even before she had spoken his name, he smiled and held out his arms to her, fairly leaping with joy. Preyer tells of a little girl seventeen months old who recognised her nurse after an absence of six days.* In this respect, moreover, the aptness of the newborn child does not exceed that of animals—of little dogs, for instance—which can very quickly distinguish the hand that caresses them from the hand that

* To be sure, Preyer found that his son did not recognise his nurse at seven months after an absence of four weeks. The power of memory, from this point of view, seems to be clearly established at about one year.

strikes them. On the other hand, all the knowledge that the child collects through the medium of his senses concerning the things that he sees and hears, the objects that he handles—all this little practical science so rapidly acquired involves a considerable exercise of memory. And it is the same with the acquisition of language; every new word that the child learns represents an effort, or at least an act of memory.

But the result of many observations seems to establish the fact that these acquisitions of the child's memory, so easy and so prompt, are, on the other hand, fragile, unsubstantial; that they vanish; that they are obliterated if any accident whatever interrupts the course of the perceptions which have produced them, and whose continuation is necessary to retain them in the mind.* Leibnitz tells of a child who became blind when two or three years old, and who never had any remembrance of his visual perceptions.† Laura Bridgman had had the use of her senses for several months before an attack of fever destroyed her hearing, her sight, and her speech; from that time on she never mentioned any-

* Memory, at first, is really only the continuation of the same impression. "The first phase of real or conscious memory," says Romanes, "may be considered as consisting in the secondary effect produced on a sensitive nerve by an excitation—an effect which, as long as it lasts, is continually transmuted to the sensorium. As an example, I shall cite the persistency of impressions on the retina, the pain that follows a blow." (*Mental Evolution in Animals*.)

† Leibnitz, *Nouveaux essais sur l'entendement*, Book I, chap. iii.

thing that she had learned before her illness. A little girl mentioned by Preyer became totally blind at the age of seven years, as the result of having been exposed to too bright sunlight. At the age of seventeen she recovered her sight; she had to learn anew, as a little child would, to name colours. She had forgotten, through want of exercise, all that during those seven years she had learned of distances and the dimensions of objects.

The conclusions to be drawn from these facts and others which might be cited is that repetition, the frequent and continued recurrence of impressions, is necessary to fix the recollections of the earliest years. The child learns his mother tongue so easily only because he hears the same words continually. He recognises objects and persons only because he sees them every day. Place him in the midst of other surroundings, send him from home when he is two or three years old, and everything that was particular or local in the impressions of his first habitation will be obliterated forever. The child's memory is like a delicate painting, which the brush must pass over several times in order to keep the fleeting colours, always ready to disappear.

We see from this that an impression which has been but a fleeting apparition in the child's consciousness, the emotion of an instant, an accidental fact, does not succeed in impressing itself, in fixing itself in the mind. The child's memory is like the moving sands of the seashore. In vain do you mark them with your footprints as the wave recedes; the returning wave effaces

all. If repetition is a useful condition at every age in assuring the continuance of recollections, it is an absolutely necessary condition when light impressions that only skim over the child's consciousness are concerned.*

Moreover, the multiplicity of new impressions of every sort which assail the brain of the newborn child is undoubtedly one of the causes of the weakness of his memory. Too many things crowd forward at once and overpower the child's perception. His little memory bends under the mass of sensations. In this respect the case of the child is the same as that of the blind person spoken of by Cheselden, who had too many objects to recognise at once, and forgot some of them. And, moreover, his inconstant attention, which, according to Fénelon's pretty comparison, resembles a lighted candle when exposed to the wind, its light wavering and flickering continually, does not give the separate sensations time to become hardened or solidified, so to speak. The child's perception does not stop for consideration; it moves—runs on incessantly;

* Compare Preyer, *The Development of the Intellect*, p. 9: "Nothing later on reminds us of the once existing inability to balance the head, or of the former inability to turn around, to sit, to stand, to walk, etc. But this is not true of what is acquired later. My child, when less than three years old, remembered very well—and would almost make merry over himself at it—the time when he could not yet talk, but articulated incorrectly, and went imperfectly through the first, often repeated performances of his nurse . . . The child of three, and even of four years, can remember separate experiences of his second year," provided, Preyer adds, "he is often reminded of them."

and in this rapid course of fluttering from subject to subject, it can not seize and lay hold of objects that are hardly touched in passing.

We have not yet indicated, however, the real essential cause that renders the continuance of the first remembrances so uncertain: it is the absence of co-ordination between the successive perceptions. Real memory, the memory of the adult, is a totality, a close woof of impressions bound one to the other, enclosed in fixed frames about a central nucleus, the idea of the *ego*. This is not the place to investigate the question as to whether the idea of self be or be not derived from the close connection of the states of consciousness which are being unfolded within us. But what is certain is that during the very first years the *ego*, or at least the consciousness of the *ego*, does not exist. There is not as yet what Luys calls "a chain, a mysterious federation of remembrances."* Scattered and floating, as it is, in a succession of separate sensations, which are not associated one with the other, but are strangers so to speak to the *ego*, and so have no personal character, the child's consciousness is not centred; it does not control itself. The inner life is not yet organized, and it is this inner life that permits adults to preserve the exact and faithful memory of events in which they have participated. By reflection, by a turning in upon ourselves, we think anew of what we have done a day, a week, or a month before. The event upon

* Luys, *The Brain, Genesis, and Evolution of the Memory*, p. 112.

which our memory is fixed will perhaps not be reproduced before us; but if the real repetition is lacking, we substitute for it an ideal and a mental repetition. In a word, the mature man thinks over his remembrances; he digests them; he assimilates them. Moreover, when the feeling of the *ego* is once born, each new acquisition of memory takes a definite place in the consciousness by the side of other impressions, before or after other remembrances; it forms part of a whole; it is, so to speak, inlaid, cemented in the mental construction of our inner consciousness, as stones would be cemented in a wall, without the power, henceforth, to detach itself. In the case of the child, on the contrary, the fleeting impressions, separated and independent one of the other—grains of dust with no cohesion—do not find place to fix themselves. The current of the inner life is not sufficiently established, and the remembrances, like waters that have not been directed into canals, are scattered and lost on one side and on the other.

The same reasons that explain, in the case of the adult, the disappearance of remembrances relating to the first period of existence, help us to understand some other particulars of the child's memory; for instance, his inability to localize in time and space even the most recent impressions. The picture is engraved on his memory, but the setting has vanished.* He re-

* Romanes says: "The last phase of the development of memory is reached when reflection permits the mind to localize in the past the time at which an event, which memory has preserved, took place."

members distinctly the things he has seen, but he can not tell where or when he saw them. Complete memory involves an appreciation of duration of which the child is incapable, since this appreciation involves the co-ordination of recollections or remembrances. Who has not heard a child tell of an event that he witnessed several months before as though it had happened only the day before? The child that breakfasted only two or three hours ago demands his dinner now because he has no notion of time passed.* The child's memory is, above all, imaginative, representative; it has not found yet, in the idea of the *ego*, in the idea of the duration of time, the solid principles on which rests the reflective and reasoning memory of the adult.

Just as, without, the child's perceptions seem to him to be almost on the same plane, and he can not project them in space with exactness; so, within, his remembrances and his impressions co-exist in him, as it were, without his being able to arrange them in a linear series, and to relate them to different moments of time. To the newborn child there is no depth in space; to the child a few months old there is no perspective in the past; there is no past. The images which he has

* "The confusion of past and present time is seen in the child. A boy two years and a half old lost his ball the other day from the balcony; he found it again, and has played with it a hundred times since: in spite of that fact, he led me suddenly toward the balcony, and told me in a very sad tone, with an expression he could not have feigned, that he had lost it there." (Guyau, *Éducation et hérédité*, p. 147.)

successively acquired are mingled in a confused chaos. The child must conquer illusions analogous to those that perplexed the visual perceptions of Cheselden's blind man before he can have the consciousness of time and represent duration to himself. His images must group themselves little by little, must be associated in a regular order, must define the idea of the *ego*, joined to that of duration, just as the representations of the exterior world form, little by little, the conception of space, and consequently the conception of what is not the self.

Another characteristic of the child's memory is its passivity; it has to be continually propped up, so to speak, by external excitations called to action by the presence of objects. The child's remembrances do not call themselves up. His little intelligence is limited almost entirely to the present; it does not think much of the future, not at all of the past. We must not expect it to delight in living over the months already passed, as the memory of the mature man will do. The child's memory resembles that of animals—without activity in itself, subordinate to real sensations. It is certain that the horse in the stable, if he thinks at all, does not think of the road he travelled over the day before; and yet, if he begins the same journey on the next day, he will know with unfailing certainty which way to go.

This influence of the presence of things already seen may be demonstrated by the facts

cited by Ribot,* which prove that under the action of particular circumstances, revived or brought to life again by the reappearance of objects long forgotten and removed from our sight, the memory of the first years, though apparently destroyed, may suddenly arise again. Abercrombie reports the instance of a woman who, on returning when about forty years old to the room in which as a little child not yet able to speak she had seen her dying mother for the last time, felt the remembrance of the emotions she had then experienced rising from the depths of her memory. She said that she had a distinct feeling of having been in that room before. There was a woman in bed in one corner, she remembered, who seemed to be very ill, and who leaned over her and wept. Carpenter relates that a man, of vivid imagination to be sure, who when sixteen months old had visited a castle to which he had been carried on the back of a donkey, on returning to the same castle long years afterward, felt clearly the impression that he had seen it before. It seemed to him that he could even see, under the porch, the donkey that had carried him before.† Perceptions recovered even after a long interval suffice, in cases of this kind, to stir the nervous cells to their very depths, to renew particular movements in the brain, and to cause, in consequence, the resurrection of correlative remembrances which were, so to speak, buried there.

* *Les maladies de la mémoire*, p. 143.

† Carpenter, *Mental Physiology*, p. 431.

In other cases it is a morbid cause, a fit of fever, which produces the same effect. Abercrombie tells of a child four years old who had to be trepanned because of a fracture of the skull. He apparently had no remembrance of this event, and it had never been spoken of to him. At the age of fifteen he was taken with a febrile delirium, and described to his mother with perfect exactness all the details of the operation.

There are many bends and turnings, many byways and hiding places in the memory. The successive events of life store up layers of remembrances, one superposed on the other, and this work begins with childhood. Forgetfulness, a positive oblivion, usually, gets possession of a large number of these impressions which we bear within us unconsciously, and which will spring up again only under the excitatory action of extraordinary circumstances; just as the characters of a palimpsest do not reappear under the writing that hides them, unless affected by chemical reactions.

It follows from all this that memory, although the results of its action are often obliterated, is by no means a stranger to the little child. How could it be, when it is developed to such an extent even in little animals? * But, as Egger has

* On the development of memory in animals, see Romanes, on *Animal Intelligence*. Memory is one of the faculties that we have most right to attribute to animals; but, whatever credit is due most of the facts reported by the English evolutionist, we must guard against attributing to personal memory

remarked, "memory is produced at the earliest age for acts that are frequently repeated; it is slower in the case of accidental acts."* It is only at the age of fifteen months that Egger claims to have observed it under this second form. "At that age Émile seizes a toy that he has left or hidden under a chair; a quarter of an hour afterward I ask him for it; he goes straight to the object and brings it to me." We believe that the remembrance of a sensation, even isolated or accidental, may come much earlier; and Egger himself furnishes us with a proof of this. "At six months Émile was slightly burned by touching a warm dish with his hand; when it is presented to him again, he draws his hand back with an evident intention to escape pain; the same observation in the case of an object harsh to the touch, the impression of which is disagreeable to him."† In these direct inductions, founded on a single experiment, the force of particular remembrances is clearly shown.

The memory of the child is not a Danaïdean cask, emptied as fast as it is filled. If no intellectual operation can be accomplished without the memory, it is equally true that no practical action is possible without it. In lactation, in play, in walking, memory has its part to play. But these remembrances, utilized as they are immediately, and sufficing to assure from day to day the regular development of the intelligence

what is only the effect of hereditary memory, of instinct determined by ancestral experiences.

* Egger, *op. cit.*, p. 11.

† Ibid, p. 10.

and of the activity, do not constitute the durable elements of the personal memory. They form part, so to speak, of that impersonal though conscious memory which characterizes the child a few months old, and which has been preceded itself by a sort of organic, unconscious memory. If in the adult memory presupposes consciousness, if it is true that we remember only what has been, at a given moment, present in our mind and felt or perceived by it, it is not impossible to hold, in turn, that consciousness in its original evolution proceeds partly from memory, at least from that obscure memory which is but a habit contracted by the nerves and the muscles. We have said that in the action of sucking, for instance, it is only little by little that the child becomes conscious, has the sense of an act which is at first purely automatic.* This transition from the unconscious to the conscious would be inexplicable if we did not admit that every repetition of the same action leaves some trace behind it, and makes deeper and deeper impressions in the nervous system, which impressions are associated and stored up, and so prepare the way for consciousness.

Memory has often been represented as a form of habit, and it is in this sense that instinct may be defined as a hereditary memory, an impersonal habit. But what distinguishes the conscious and personal memory in its subsequent development is the fact that the sensation which

* See chapter ii.

is presented to the consciousness anew does not appear to it as a stranger, as an unknown; it is, in a word, the fact of recognition. We are not called upon here to seek an explanation for this; recognition, moreover, seems to be one of those ultimate facts that resist analysis. But what we have to ascertain is that, thanks to his personal experiences, the child very soon recognises sensations; for instance, the particular taste of the milk with which he is fed.* After several successive acts of sucking, the nursling has evidently acquired the remembrance of the taste of the milk, so that if there is a change he will perceive it. It is much easier to bring up a child on the bottle, to nurse him artificially, so to speak, if he has never been nursed at the breast.†

* Compare Romanes's *Mental Evolution in Animals*. Romanes distinguishes two phases: that in which a present sensation is felt as analogous to a sensation already felt, and that in which, on the contrary, a present sensation is perceived to differ from a past sensation. He adds: There is not, in these cases, a conscious comparison between the two sensations; there is not even an act of ideation; but the past sensation has left its trace in the nervous tissue in such a way that when it is presented anew it appears in the consciousness as being a sensation that is not unknown, but familiar; or if it is replaced by a different sensation, the latter appears in consciousness as being an unknown sensation, unfamiliar.

† The same fact is observed even in the lower animals. Reamur (*Entomologie*, vol. i, p. 391) says that larvæ, having lived some time on one plant, would rather die than change their food and live on another plant, which, however, they would have accepted if they had been accustomed to it from the beginning.

In the first stages of the evolution of the memory there are only sensations which are renewed, and which, by a mysterious power or faculty, recognise themselves, so to speak, or, if they are different, distinguish themselves and perceive their own differences. There can be as yet no question of appealing to the intervention of some mental power distinct from sensations, which would appreciate their difference or their resemblance as an independent witness. This mental power is not yet formed, nor, in consequence, is there yet a real memory awake in the interval of sensations and in their absence, tending, through the association of ideas, to unite and call up again, one after the other, the remembrances whose relations it has appreciated. As Romanes has very aptly expressed it, there is then no longer simply the memory of a past sensation (which sleeps until the moment when it is awakened by another sensation resembling it, or differing from it), but there is the memory of two things at least, and the memory of a relation previously found between them. But in order to arrive at that point, an essential condition is required in addition to the natural progress of intelligence, of what English psychologists call "ideation"; it is the possession of language. If words, indeed, are necessary to the formation of more or less clear general ideas, they are indispensable also in fixing the remembrance of the particular perceptions themselves, and in causing them to remain. And to all the reasons that we have given to explain the weakness, the uncer-

tain state of the memory during the first months, we must add, as one of the most important, the absence of language.

II.

Thus far we have described only the preparatory period of mnemonic development, a period of gropings, of weakness, and, so to speak, sudden swoonings, during which the memory seems to stumble at every step, working only from day to day, incapable as yet of keeping a firm and even gait, and passing through moments of torpor; for instance, when the child who has happened to pronounce the eagerly watched for syllable *pa* does not find it again for several months, and seems to have forgotten it.

Moreover, let us not regard these first periods of the development of memory as unimportant to its future. The faculty of recognising persons and things is in itself of some importance.* Language itself, a condition of subsequent positive development, is acquired only by the aid of the nascent memory of the child.

It is true, nevertheless, that the period of the memory proper does not begin until the child can talk. Then, indeed, the child does not acquire merely a minimum of trifling and necessary knowledge through the senses; he can learn and

* "Before he is two years of age the child has very precise remembrance of things familiar from his point of view—of whippings, sweetmeats, falls, a kitten, a bowwow, a hobby-horse, a toy, caresses, kisses, etc." (Nicolay, *Les enfants mal élevés*, p. 308.)

retain what is told him, can interest himself in stories, can acquire finally ideas that are strangers to his experience.

It is almost commonplace to extol the merits of the child's memory, and especially its marvellous facility of acquisition. "Observe the child attentively, and you will discover in him a power of absorption and assimilation that is almost prodigious, and is found at no other age. The child's mind is like a sponge, always thirsty."* It is easy to understand why this is so. First, there are physiological reasons for this extreme faculty of absorption, and the state of the brain should be mentioned as the first. Luys says: "In young children the cerebral cells are flexible and pliant." Besides, "the cerebral matter is occupied perpetually with the work of organic development; new elements are continually being added to the old." Later, the cerebral matter will have less flexibility, less plasticity; a period of fatigue and of saturation will come. The physical structure of the brain will be determined; new divisions will no longer be opened. We see, then, what favourable conditions the cerebral organism offers in childhood for the development of memory. It is the period when, in its freshness, in its vitality, the brain most resembles a sensitive photographic plate, receiving and storing up the slightest shades of objects; it is also the moment when, so to speak, the house is not yet finished, and new stories are being placed one

* G. Droz, *L'Enfant*.

above the other, when, in consequence, there is room for ceaseless new acquisitions.

But the psychological reasons are quite as clear as the physiological reasons. What impedes the work of storing up remembrances at a more advanced age is, first, that the personal reflection, inner preoccupations, and also the passions, turn us aside from the observation of things as they are. The mature man, or even the youth, centred as he is in himself, finding in his own thought sufficient food for his intellectual life, has not his eyes open on the world, so to speak, in the same degree as the child. On the other hand, being already overburdened and encumbered with remembrances, the adult memory is less supple, less active in its motions. The paths of access are obstructed. The place is taken, so to speak, and a new remembrance, to be fixed in the mind, often has to take the place of an old one. If it is true that there is a limit to the possible acquisitions of memory, it is natural that the acquisitions should be easiest at the age when the mind is furthest from this limit. In the adult a new acquisition often displaces prejudices, preconceived beliefs. We give only a distracted attention to ideas that are presented to us for the first time; and even a sort of instinctive repugnance keeps us at a distance from them. We are far from that state of naïve candour of the mind which accepts all, even becomes enamoured of all. Doubtless one has more power of attention at fifteen than at ten, more at ten than at four or five; so the progress of age improves and fortifies one

of the conditions of the acquisition of remembrances. But we must not forget that the defects of the child's attention are compensated for by valuable qualities; his attention does not last long, it is true, but it is always ready, always in motion; a searcher and ferreter, it is always on the watch for new impressions.

Under these conditions, it is not surprising that the child, who sees all, who hears all, whose curiosity grasps all the details of things, should soon acquire a great many remembrances. George, at the age of four and a half, told me what he had seen several months before in a picture of skating; nothing escaped him, not even a little dog which was seen on the ice; he knew the number of ladies, the number of gentlemen in the sleighs. Hence the sometimes unbearable babbling of the child, who does not spare you any of the trifles, who notes all and tells all, the insignificant and secondary as well as the important. And if it is true, as Ribot claims, that forgetfulness is one of the conditions of memory, whose exercise would be impossible if, in order to reach a remote remembrance, it were necessary to follow the entire series of terms that separate us from it, this condition is lacking at least in the memory of the child, who has learned little as yet and can forget nothing.

At least the child forgets nothing of what he has recently learned, nor, above all, of what has affected him keenly. Memory, like attention, like imagination, and the different faculties or forms of the intelligence, depends in part upon

the sensibility. And this explains why the recollections of childhood (those that date from the fourth or fifth year) are so remarkably tenacious, and remain with us all our lives. Doubtless they have this advantage over later remembrances—namely, that they came first. By the right of the first occupant, a remembrance acquired in the first years has less difficulty in fixing itself forever in the mind. But the particular emotion which moves the child when his impressions are new has much to do with the duration of his first remembrances. And here we have the explanation of the charm which the remembrance of the events and sensations of our first years has for us when we have reached middle age, and the shadows of the night of approaching old age are closing in around us—for instance, a bit of song that our mothers used to hum, whose refrain still lingers in our ears, or a bit of landscape of our native country lighted up by the clear sun that dazzled our childish eyes.

Nothing demonstrates the solidity, the persistent vitality of the child's recollections, more clearly than the study of mental diseases, of morbid amnesia. It has been established by repeated observations that in the abnormal states which cause a gradual destruction of memory, the recollections of childhood are the last to disappear. They constitute a first layer, resisting and tenacious, which the disease does not break through until the very last. Luys says that memory, in its decay, loses its remembrances in the exact

chronological order in which it has accumulated them.

But in the normal life of the man healthy in body and in mind, the remembrances of childhood, if not the only ones to last, are nevertheless most prompt in reviving themselves. "As I approach old age," said Rousseau, "I feel that my recollections of childhood are renewed, while the others escape me." To be sure, imagination plays a part in the complacent glance which the old man casts upon his past, and with imagination a certain egoism also, a personal tenderness for the age when he was young and strong. It is true that the remembrances recalled by celebrated writers are not all exact and faithful. They yield in these recitals to the desire to put themselves forward, to pass for little prodigies, to attribute to their childhood the ideas and feelings of a grown person. They yield thus, very naïvely, to the natural tendency of the imagination to embellish and transform everything that is at a distance. "Every one has noticed," says Doudan, "that the recollections of childhood and of youth take on, little by little, as life advances, the character of the ideal. . . . Our impressions at that time were extremely vivid, and their object often trifles, but in the distant perspective in which life leads us, in going back to the time that has fled, we exaggerate all those objects according to the impressions that we have remembered. We make wonderful spectacles of those vanished days, so that they may correspond to the intensity of the feelings which moved us then. In the spring-

time of life the brilliance of the sun and of Nature excited us to the point of mad joy, and in returning to those days in thought we see a higher Nature under a brighter sky than our eyes have ever beheld." * We have all felt these illusions of memory, which at a distance idealize and metamorphose everything. The people we knew in our childhood appear to us as shadows; a sort of confused vapour envelops their outlines.

It seems, however, that by an effort of reflection, on rummaging in the recollections of the fourth or fifth year, one may find something besides vague impressions, and recall very precise and clear circumstances. If the memory is strongest in the morning, or after meals (moderate meals, to be sure), when the physical forces have been renewed, refreshed, whether by sleep or by alimentation, it is natural that in the morning of life, when the soul awakens for the first time in all its youth and freshness, the faculty of memory should be developed also with extraordinary power. We do not subscribe to the opinions of those who say, with Egger, that the child retains only impressions and not "precise observations." † Experience proves, on the contrary, that notation, properly speaking—that is to say, the exact perception of the sensible characteristics of things or of their signs—reaches a high degree of development in the child. At the age of four George had remarkable facility

* *Pensées et fragments*, Paris, 1881, p. 58.

† Egger, *op. cit.*, p. 36.

in counting; he could count up to a thousand and even beyond without the slightest hesitation. Egger himself says that Émile at five and a half was more interested in numbers than in anything else, and that he learned them more quickly. We may mention, also, the remarkable facility with which the child learns the letters of the alphabet. Finally, the rapid acquisition of words is undeniable proof that the child's memory is qualified to receive more than mere impressions.

To tell the truth, the capital fault of the child's memory is that it is literal and mechanical.* It is only the exact reproduction of images formed by the senses, the representation of the sensible form of realities. It is, above all, verbal. The memory of words, which is so important at every period of life, reigns as sovereign in the child. To demand that he should recall "impressions" would be granting him a depth of inner feeling that he does not possess; nor is he capable of remembering abstract and general ideas which he does not understand, and of which he retains only the verbal expression. This explains the impatience that he shows if one changes a single word in a story with which he is very familiar,

* This passion for literal exactness, which makes a sort of stereotype plate of memory, exists only in the beginning. Toward the fifth or sixth year, on the contrary, the child endowed with imagination likes to constitute himself a partner with the person telling him stories; and joins in the narration by making corrections and additions. Egger has spoken of this (p. 89), and he sees in this fact an explanation of the origin of legends, each new narrator modifying the primitive text, and unconsciously substituting fictions for realities.

and which is being told him, perhaps, for the tenth time. He stops the narrator at the slightest modification of a text which is, as it were, sacred to him; at the slightest interpolation he cries, "No! not that!" and demands the original text. The story of Jonah was being told Boulot: "Jonah was a good man——" "Oh, no!" said Boulot, "it always begins with 'Once upon a time.'"

The child's memory has all the imperfections implied by weakness of judgment and of reasoning, or at least by the predominance of the automatic over the reflective faculties. It resembles in more than one respect the memory of imbeciles, which sometimes survives the ruin of all the other faculties of the mind. "The memory of imbeciles," says Dr. Sollier, "is sometimes greatly developed; but on careful observation one finds that they always tell things in the order in which they have learned them, and that they do not understand them. The slightest inversion, the least interruption, stops them. It is pure automatism. No matter how many times you make them go over it, they tell it in just the same way; for instance, if an imbecile has learned the days of the week beginning with Thursday, and you ask him to enumerate them, beginning with Monday, he may be utterly unable to do it."*

Of all the intellectual faculties or functions, memory depends most on the organism, and that

* Dr. P. Sollier, *op. cit.*, p. 225.

is why it presents so many differences and so great variations in different individuals, whether in respect to its general strength or its special aptitudes. Moreover, it is not in man alone that it presents striking inequalities. Sir John Lubbock tells what he has seen in the case of bees: "Among the bees that left the hive by the little postern gate, some learned in a few lessons to find it again; others had great trouble in doing so. There was one even that I tried in vain to induce to enter at different times during the ten days that it came to the honey; it could never find the opening."*

In the same way, what diversity of natural disposition between one child and another, whether in facility in learning or in tenacity of memory! So, too, what inequalities in the different forms of memory even in the same child! Memory is not an indivisible faculty; it includes distinct powers which correspond either to each one of the five senses or to the different operations of the mind. There are even more memories than senses, for one can remember forms with precision, and still be little sensitive to colours.

But, although memory varies in its forms and in the degrees of its power, it is nevertheless in different proportions common to all intelligences. It is really the first condition of all work of comprehension, of all development of the mind. Successive perceptions acquire value only when memory preserves them, and when, accordingly, it

* Cited by Romanes in his *Animal Intelligence*.

renders possible the comparison between them and the new perceptions that follow them. It is a question of determining whether the perception—the primary and fundamental fact—constitutes as yet an intelligent act, in the highest sense of the word. We are disposed to incline toward the negative. Perception, forced upon the mind by the external medium, although conscious, does not show the activity of the brain. It is another matter when, by means of memory, a comparison can be made between a past and a present perception. In that case, from the joining of two psychic facts, each one of which, if alone, would have no importance in the evolution of the mind, springs the first intellectual act, properly speaking, the judgment by comparison, the first link of the chain, which, being continually increased, will form the human mind.

CHAPTER VII.

THE DIFFERENT FORMS OF IMAGINATION.

Perception, memory, imagination.—Representative and active imagination.—Characteristics of the image.—Representative imagination not absolutely passive.—Difficulty in appreciating the first traces of imagination in the little child.—Dreams.—Imagination in the interpretation of drawings.—Imagination, when the child begins to talk, or at least to understand the language of others.—Stories.—How the child becomes narrator in turn.—Inventive imagination.—Analogy between the child's mental state and the mythological period of primitive peoples.—The child animates, personifies inanimate things.—Different examples of this tendency.—The child is not completely deceived by his own inventions.—His imaginative inventions are often only play.—The child's poetic instinct shows itself under the dramatic form.—The inventive imagination of the child does not require many material instruments, but sometimes does without them entirely.—The æsthetical sense. It does not exist in the child.—Why is the child's imagination disposed to enlarge the proportions of things?—Causes of the activity of imagination in childhood.

PERCEPTION, memory, imagination are three distinct terms, three successive and correlative stages of intellectual development. The child remembers only what he perceives, and it must necessarily follow that the faculties of perception have acquired a certain force before the faculties

of memory can be really exercised. Imagination, on its side, presupposes memory; it is from distinct and precise remembrances that the images burst forth. In imagination itself, moreover, we must notice two consecutive and closely connected steps: First, the pure and simple representation of things perceived and recalled; then the construction, more or less original, of new images which have no exact correspondence in reality. And in order that the mind should accomplish this work of combination, of invention, in a word, of active imagination, it is evidently necessary that it should be able to dispose of a large number of sensible representations.

The child sees snow the first winter of his life. He certainly does not think of it after it has disappeared. But when winter returns, and with it the snow, he recognises the white heaps which meet his gaze for the second time; memory appears, and if he already knows the sense of the word "snow," he will remember every time that it is pronounced in his presence that he has seen snow in the garden, in the street, in the fields. And from these repeated recallings of the same remembrance will come, little by little, the image of snow, the cold, white mass that covers the earth like a carpet. The child, on the other hand, has seen mountains; he retains the remembrance, the image of them; and when, later, the adventures of this or that sailor at the north pole are told him, when he hears of mountains of snow, the distinct representations, the different images already formed in his mind will be

joined and combined to form by a first effort of inventive imagination an approximately adequate conception of those piles of frozen snow of the polar regions which he has never seen and probably never will see. And if we go a little further still there will come a moment when the child will perform the entire act of creative imagination, when he will not only represent to himself a mountain of snow, a glacier, but, in combining with this isolated representation others acquired from his own experience (the cold that he has felt, the falls he has had in his coasting), will picture to himself in his day dreams the suffering undergone, the dangers run by the sailors roving in the lonely polar regions.

In other words, if memory results from the renewing of perceptions, from the renewing of remembrances comes, in its turn, the image. Imagination is not distinguished from memory simply by the fact that the image is more distinct than the remembrance, more representative of the sensible qualities of reality—more picturesque, in a word. It has above all this characteristic—namely, that it constitutes a purely mental act, independent of objects, an ideal drawing, an inner representation of things seen or felt, a conception, finally, tending to reproduce itself by the forces of the mind alone. In the little child, as we have seen, memory does not act except when in the presence of facts that have been perceived before and reappear; the remembrance is not, as it will be later, a mental reproduction which the mind carries on even in the

absence of objects. A certain time is necessary in order that the absolutely subjective representation may be separated, detached, so to speak, from these phenomena of memory, which are renewed every time an object or a person reappears before the child, and that it may be established in the mind and become an image; the image, which is, as it were, one of the elements of that inner museum which every man of imagination carries within him, which he can survey even when closing his eyes, since he "carries it in his eyes," *in oculis fert*, as the Latins said when they meant to express the idea of thinking of a loved one.

Representative imagination is not then an absolutely passive phenomenon. To liken images to footprints made in the shifting sands, or to the characters stamped upon a sheet of paper by a printing press, is simply to draw a comparison between analogous facts—complete assimilation would be absolutely erroneous. Even in the phenomena in which it seems to receive passively, as soft wax would do, the images coming from without, the active soul already shows itself. An engraving is one thing, an impression is quite another thing, and the image, in its turn, sums up and condenses a large number of impressions. It is wrong, then, to represent imagination and abstraction as two opposed rival powers. The truth is, that in imagination there is a beginning of abstraction; it is not the whole object that passes into the image, for the image is but an abridgment, an abstraction, in a way, of

different successive perceptions, since the mind retains only a certain number of qualities which are common to all these perceptions.* There is not a single act of reproductive imagination which is an exact reproduction and nothing more; we always modify something, either by omission or by addition, in the images of things; and invention, personal construction, appears even in the first attempts of representative imagination, without the intervention of the will in these different modifications.

These considerations lead us to conclude that even if imagination is strong in the child, as the whole world agrees in saying, it is not, even in its simplest form, as precocious as one would be tempted to believe. If it were possible to open the brain of a child five or six months old, and to read there what its consciousness is still powerless to decipher, we believe that these photographs would not be found there. Before imagination, even exclusively representative imagination, can take its flight, the inner forces of the mind, or, to translate the same idea into

* Imagination is different from memory. I have in my mind the idea of a mountain which I perceive every day from my window, when I spend the summer in the Pyrenees—a pure phenomenon of memory. All the details are stored up in my consciousness; the tall green trees, the meadows lighted up by the rising sun, the form and outlines of the peaks . . . To imagine a mountain is quite another thing; it is to represent to one's self an ideal mountain, by a fusing of remembrances, not ideal in the sense of more beautiful than reality, but because it is an idea distinct from the perceptions which have prepared it.

physiological language, the cerebral centres must have attained a degree of development which the child at that age is far from having reached. Even if imagination is but the copy, a sort of tracing of sensible objects, still that transmutation which creates a mental world, an ideal world, by the side of the real world, is not the work of a day.

Let us not seek, therefore, examples of imaginative power in the very young child. As long as he does not speak, it is very difficult to penetrate into his consciousness, still mute, to seize upon the germs of imagination. The newborn child has the means of making us see that he perceives, that he recalls; but at just what point these perceptions and these remembrances culminate in a veritable work of imagination is what we can hardly divine.

Perhaps the child will give us a better glimpse of the activity of the budding imagination when he is asleep, when dreams appear. In spite of the obscurities of the subject there seems to be little doubt that the child dreams at a very early age;* it is impossible to prove it, however. Egger has rightly said that since the child dreams before he has the power to testify to it in words, by recounting his dreams to us we can never tell at what moment the phenomenon is produced for the first time.† In default of testimony from the child himself, we must con-

* In the fourth month, when fast asleep, Tiedemann's son made the motions of sucking.

† Egger, *op. cit.*, p. 36.

tent ourselves with appearances, with external signs, which betray the inner agitations of the mind of the sleeping child. Here is an instance reported by Egger: "From the second year I have seen a child wake suddenly with cries, caused doubtless by some painful sight; he had had bad dreams." So a child nine months old, when fast asleep on his mother's knee, after having nursed, began to repeat the motions, the sudden starts which he had performed a few moments before; he was evidently dreaming—dreaming that he was nursing or that he was going to nurse. Later, the child will dream of his plays; he will laugh or smile in his sleep. Or he will groan; he will be a prey to some imaginary terror. Moreover, we may conclude, *a priori*, by analogy with what takes place in animals, that the little child can dream. Lucretius tells us that dogs dream:

So, too, the hound, amid his soft repose,
Oft starts abrupt, and howls and snuffs the breeze,
With ceaseless nostrils, as though full at hand
He tracked the antlered trembler.*

Tiedemann, however, is of the opposite opinion. He says that little children make motions and noises in their sleep as though they were

* De Natura Rerum, Book IV. With respect to animals modern observers are all agreed that they dream. See Romanes's *Evolution*, etc., p. 141. Not only the dog but the horse also dreams, as is shown by his shivering and trembling in his sleep. "The dreams in the case of a racehorse probably are associated with some imaginary race, as those of the hunting dog with pursuit and imaginary hunts."

dreaming, although they probably do not dream; they move simply because of the irritability of the body. Nurses and mothers ordinarily attribute these motions to dreams; but, according to Egger, they do not distinguish what is mechanical from what is the action of the soul; they confound purely organic motions with psychic phenomena, which are habitually produced only in the adult.

Some weight must be given to the wise observations of Tiedemann, and there is no necessity for exaggerating the matter by seeing proofs of memory or of imagination in all the motions of the sleeping child. The confused sensations which sleep does not put a stop to altogether—for instance, the uneasiness caused by an uncomfortable position or by pain—may often explain these appearances.

But let us return to the waking life. It would be an exaggeration to hold that the child shows no signs of imagination until he begins to speak. When he cries for his mother or his nurse, who has just left him, is it not probable that already he has in a certain measure the power of picturing absent ones to himself? When he shows impatience to go out as soon as he sees his nurse making preparations for a walk, is it not probable that he is excited by the vague image of former airings and of the pleasure he has found in them?

It is a beginning of imagination when the child recognises objects in a drawing or painting, and there is no doubt that the child is capa-

ble of interpreting and appreciating the images shown him in a book. Mme. Necker de Saussure says: "I have seen a child eleven months old recognise a very small dog in an engraving. All children amuse themselves with pictures after the age of one year."* It is to be remarked, moreover, that the presentation of pictures drawn on paper or on linen aids greatly in the development of children's imagination. An image traced by the designer's pencil or brush is indeed a reproduction of reality on a smaller scale; consequently, it favours the analogous work which the mind is obliged to do in passing from the perception of real objects to the conception of the mental image.

But it is when the child begins to speak, when he understands the sense of words, that the activity of his imagination finally shows itself by unmistakable signs. It shows itself, for instance, in his interest in the stories told him. "The pleasure which the recital of the simplest narration gives children results from the vividness of the representation in their minds. The pictures called forth within them are perhaps more brilliant, more highly coloured than the real objects. The recital has the effect of a magic lantern upon them."† This is perhaps straining a point. We hesitate to believe that the representative imagination of the

* Mme. Necker de Saussure, *op. cit.*, Book III, chap. v. We have spoken of the difficulty experienced by Cheselden's blind man, two months after the operation, in believing that pictures represented real objects.

† Mme. Necker de Saussure, *op. cit.*, Book III, chap. v.

child possesses as yet that colouring power, that intensity of mental vision which it acquires only in the case of the painter and of the poet. An important place must be given to the satisfaction of curiosity, the charm of the unknown, in the fascination which stories have for the child's attention. Since in our mature years we still find such keen enjoyment in penetrating ideas that are revealed to our minds for the first time, how shall we measure the degree of pleasure which an amusing tale, well told, would afford the child for whom everything is new? Notice (and this proves the relative weakness of the imagination, or at least shows its limited character) that the child likes above all the stories in which he figures himself, which recall to him his personal impressions and the incidents of his own life. Notice, too, that when a story which he already knows is told him again, even for the tenth time, he demands the exact wording to which he is accustomed, as though his imagination, still frail and weak, had to grasp it several times in order, even in the simplest tales quite within his range, to appreciate the sense of that which he makes people repeat to him with an insatiable avidity.

The representative imagination is not the only source of supply for the intellectual work which is accomplished in the child's mind when he is, as it were, hanging upon the lips of a narrator. A little effort of constructive imagination is necessary for him to understand, even in the most familiar tales, the expressions that do not corre-

spond exactly with his experience: for instance, the desert or the ocean. The epithets that accompany these words, the definitions which will be given him, for instance, "The desert is a flat country, bare and sandy; the ocean is a vast extent of water"; all that, to be understood, presupposes that the child is capable of combining, of associating the different particular images which each one of these terms calls up, so as to evolve a more or less perfect and approximate conception of the desert or of the ocean which he has never seen.

The exercise of the imagination is, so to speak, suggested by an outward excitation in the case of hearing a story, as later in the child's personal reading. But imagination may act of its own accord, may set itself going, so to speak, at a very early age. When the child becomes narrator, in his turn, we feel from the exactness of his descriptions and the precision of the details which he accumulates, that he sees mentally all that he describes. It is evident that the child two or three years old thinks, above all, in images. The power of abstract reflection which allows the adult to use words as he would algebraic signs, without representing to himself the thing signified, is unknown to the child. Every word that he hears pronounced or pronounces himself gives rise to a whole series of images. And when by prolonged habit he has trained his imagination in the recollection of scenes that he has witnessed or that have been described to him, he becomes capable of inventing original ones him-

self. "The child three or four years old," says Sully, "who has heard a great many tales will make new ones out of them." The same author tells of a little girl, five years and nine months old, who found a stone with a hole through it; whereupon she imagined a whole fairy tale: the stone was a wonder stone; the hole represented beautiful apartments in which fairies lived.*

It is thus step by step that the imagination becomes inventive, aided by the imitation of the inventions of others. Here, as in the case of all the other faculties, there is not complete spontaneity, although there is perhaps more here than elsewhere. The imaginative faculties respond better than do the others to the nature of a being who is still destitute of reason and of experience. We have sometimes been startled at the facility with which one can make a child wander from his subject if his imagination be stimulated and fed ever so little, led on from one dream to another. But the child, even when left to himself, gives himself up to incoherent and strange conceptions. Sully tells of a child, three years old, who continually wished that he might live in the

* Compare Egger, *op. cit.*, p. 58: "At four years Félix loves to have little stories told him, which he certainly does not understand very well; he follows them attentively and asks to have them repeated. His mind takes hold of certain words or phrases, and that is enough to attach his curiosity to the whole with a sort of passion. He even tries to imitate these little narrations. But the recitals he gives us are disconnected, hardly intelligible; his childish narrations are nothing more than an amusing verbiage for his vanity which believes that it is making him like grown people."

water as fishes do, or that he might shine in the heavens like a star.

Taine has rightly said: "The mental state of little children is in many respects that of primitive peoples in the mythological and poetic period." * If we should let the child alone, and if education did not come in to put reason into his fancies, we should see him creating a new and complete mythology. We often, doubtless, help him out in his superstitions; we suggest his errors to him when we speak to him of *little Jesus*, when we tell him the story of the black boggy. But the perfect good faith, the candour, the touching innocence which he displays in his absolute adherence to these fables, is the proof that he has a natural disposition to live in the marvellous. There can be no doubt that the child spontaneously gives full scope to this mythological tendency which is one of the primitive instincts of human nature. He invests inanimate objects with life and feeling; he personifies them; he deifies them sometimes, just as he will humanize animals and be a prey to La Fontaine's fictions.

Let us cite a few facts in this connection. A little girl three years old observed by Taine, to whom it was said that the moon had gone to bed, asked, "Where then is the moon's nurse?" Here, to be sure, the child's imagination simply obeyed the suggestion already contained in the figurative language that had been used in speaking to her. But other observations are more con-

* Taine, *Revue philosophique*, 1876, Book I, p. 14.

vincing. Tiedemann relates that his son, on looking for a rainbow in the clouds and not finding it (he had seen one a few days before), said: "The rainbow is asleep now." Insufficiency of language, it will be said, and pure metaphor! We believe that there is something more—a sort of assimilation. And the same child, not seeing the sun on the horizon, said: "The sun has gone to bed; to-morrow he will get up; he will eat a piece of bread and butter!"

The child enters into conversation with his playthings of his own accord. The doll is a real living being to him. In the same way he says, "My carriage will not walk; it is naughty!" And when one speaks to him of a familiar animal or of a familiar object, he will say, "What does the rabbit say? What does the big tree say?"

If a child twelve years old, brought up according to the laws of Nature and on the pattern of Rousseau's *Émile*, could be found, as Sentenis relates,* on his knees in the garden, adoring the sun, is it not evident *a fortiori* that the very young child whose imagination is not yet controlled by the severities of experience would naturally yield to analogous suggestions, would abandon himself to mythological conceptions and conceive of the things of Nature as being in his image by a sort of naïve anthropomorphism?

George Sand says in her *Mémoires* that all

* See the report of Villemain, under the head of *L'Enseignement régulier de la langue maternelle*, by P. Girard.

her life as a child was a life of imagination. She cursed the day when doubt first came to her as to the existence of Santa Claus, the mysterious distributor of playthings. She combats the austerity of Rousseau and of all who would extinguish the flame of childish imagination by blasts of positive explanations. "To take the marvellous out of the child's life," she says, "is to go against the very laws of his nature." The child naturally lives in a medium which is, so to speak, supernatural, where everything within is wonderful, and everything without must seem wonderful to him at first sight.

Tiedemann has cleverly deduced the reasons which explain the anthropomorphic conceptions of the little child. "In the first place," he says, "it is a law of his intelligence that he can not picture to himself the unknown except in terms of the known." But the child knows first his own sensations, his emotions, the accidents of his life; hence a natural disposition to imagine that other beings and even things live, feel, and act in the same conditions as himself, that the moon has a nurse, that the sun breakfasts. Moreover, and this is also an important reason, the child has to believe that things are animate to a certain extent in order to sympathize with them. When the little child Mme. Necker tells us of saw her cup broken and cried, "The poor cup that I loved so well," and then broke into tears, it was not a cry analogous to that of the housewife when she loses an object more or less precious to her; it is partly the illusion of a sympathetic

sensibility animating and personifying everything. Savage peoples obey the same imaginative feeling when they dream of a paradise where there will be room not only for themselves, but for all the objects they have used during their lives—for their arrows, for their boats.

If modern positivism were not hemming the child in more and more, the examples of these childish illusions would doubtless be much more numerous, since they are not, as Mme. Necker believed, voluntary illusions, but evidence often a naïve and complete error. We can catch passing manifestations of this instinct of the marvellous, from which arise the superstitious beliefs of humanity; and on this point the most refined little Parisian is the equal of the little savage, which proves, among other things, that Nature is stronger than heredity.

The preceding observations, however, call for some reservations. The nature of the child is not less various than that of the man; and if, in many cases, the child is a complete dupe to the fictions of his imagination, if he renews the superstitions of idolatry and fetishism in his fantastical beliefs, it is, for the most part, only a semi-illusion. Like the poet, he delights in his fancies without believing them. The poet, who lives in the world of his creations, does not believe in the reality of his heroes, but he speaks of them as though they were real; he sees them before him in flesh and blood; he hears the accents of their words and the sound of their voices.

And without being poets, we all feel the beginning of an illusion analogous to this at the theatre; we are not really deceived by the events of the drama being played before our eyes, yet we are to a certain extent; we lend our interest to the characters in the play as though they existed, and yet we know that they do not exist.

The child of whom it has been said that he is born a poet* often finds himself in the same state of mind. He is himself the fashioner of his illusions; he invents the falsehoods that charm him; he plays with his fictions, and he makes believe that he is allowing himself to be deceived by them, finding infinite pleasure in this game. "He knows that he is dreaming, assuredly," says Droz, "but he experiences a real happiness in playing this little comedy with himself."

There are abundant observations on this point. From the time he was two years old Marcel played "Rock-a-bye, baby" with every object that came into his hands—with a pencil or a medal. When asked the time, he would put his hand on his heart and answer, "Two o'clock," drawing a comparison for fun between the ticking of a watch and the beating of his heart. George at the age of four made three balls of lead play the part of people; one was the cook, another the nurse; the largest one was the mis-

* "Observe the child," says M. G. Droz, "and you will discover in him a wealth of imagination which delights in prodigies, and which is found at no other age. Is there not more true poetry in the brains of these little darlings than in twenty epics?"

tress of the house; and he imagined dialogues between these three people. "Now," says the mistress, "will you go and get some water?" So also Tiedemann's son. "On the twenty-ninth of October (he was two years old) he took several pieces of white cabbage and made them represent different people who were pushing themselves forward and extolling their own merits."

Espinas has collected the following observations: "A child a few months old on being given the bottle wishes it to be offered first to a little wooden horse, roughly fashioned with a knife, which he is very fond of. He knows perfectly that the horse does not eat, and that is precisely the cause of the pleasure he derives from this little ceremony. It is a play to him; a fiction. All children show very early this faculty of being pleased with fictions, as is evidenced by the endless jests of nurses, who hide themselves or the children, in order to find them afterward amid triumphant bursts of laughter. Their readiness to enter into games of this sort is always astonishing. I have seen two children just learning to talk, who were seated opposite each other at table, amuse themselves for a quarter of an hour at a time by showing each other crusts of bread and christening them with names of animals, even when there was not the slightest resemblance between the form of the object and that of the animal mentioned. Each partner in this game considered attentively the object presented by the other, and seemed to take the great-

est pleasure in thus arbitrarily calling up different images." *

Another example. Guyau says: "To my child, two and a half years old, every fruit is an apple, every colour that attracts his eyes is red, because red is essentially the showy colour. When he is in his cradle he shows me the middle of the bed and then the edge, and says, 'This is the road and that is the ditch.' He imagines these things of his own accord, no one ever having suggested such a game to him. The explanation is simple enough: he is so carried away by superficial analogies that he soon fails to see the differences; I am persuaded that when he goes to sleep he believes himself to be lying in the bed of a white road with ditches on each side of him." †

It is under the dramatic form that the poetic instinct peculiar to the child's imagination likes best to show itself. Egger gives a characteristic proof of this. "A child twenty months old knows, recognises, and recalls quite well from memory several persons whom he sees frequently in the Luxembourg Garden—a nurse, for instance, and the child that she takes care of. One day he left us, pronouncing more or less distinctly the three names, Luxembourg, the nurse, and the child. He went into the next room, pretended to say 'How do you do?' to these two people, then came back to tell us with the same simplicity

* Espinas, *Observations, etc.*, p. 387.

† Guyau, *Éducation et hérédité*, p. 148.

what he had just been doing. There was evidently nothing in the room to remind him of Luxembourg, or of the people who frequented it. It was what I shall call an act of dramatic imagination; it was a drama in its elementary germ."*

The child usually assigns himself the principal rôle in these imaginary scenes. He pictures himself or pretends to picture himself as a grown person. Little girls take the part of their mammas; little boys play soldier, coachman, and keep up the fiction for some time. Egger tells us that Félix played coachman when he was about four years old. One day while he was engaged in this game Émile came into the house. In announcing his brother, Félix did not say, "Émile has returned," but spoke of him as "the coachman's brother."†

The child usually seems to need a little external machinery in order to thus exercise his inventive imagination. He takes some object as a starting point, which the "alchemy of imagination" immediately transforms and metamorphoses. Anything will do. He rides horseback on a stick. A stool turned upside down is a boat or a cab; set upright, it is a horse or a table.‡

* Egger, *op. cit.*, p. 12.

† Ibid, p. 55.

‡ "Playthings representing lifelike animals are little aid to, and may even hinder, the play of the child's imagination. For two entire winters a child left alone in a room every morning amused himself in a marvellous way with chairs. He arranged them in different ways, and they represented to him either a train of boats or of wagons, or a carriage and horses. You should have

A bandbox becomes a house, a cupboard, a chariot—in short, anything that it pleases the child to imagine it, according to the fancy of the moment.*

Sometimes, however, the child does without any material symbol: witness the little girl mentioned by Egger, who amused herself with an absolutely fanciful companion. “When I play with my little Jane,” she said, “it is all make believe.” So, too, the child who, according to Mme. Necker, amused himself by feeding imaginary birds in an imaginary poultry yard, with imaginary grain, insisted that the door of the room in which he said he kept them should be open, and if, by chance, any one closed it he immediately began to cry, saying, “People are keeping my poor ducks and chickens from going out.”

In all these examples, as we have said, the child makes himself the voluntary accomplice of his imagination; he plays with it more than he is played upon by it. Unfeigned illusion, however, has some part, too. The proof of this is that the sensibility is really moved. Real tears are shed

seen the air of seriousness with which, from the top of one of his chairs, he plunged his pole (represented by a cane) into the deep water, or mimicked the locomotive, or lashed his fictitious horses, his armchair representing the coachman’s seat, and two lower chairs the horses. He spent hours in this play every morning. A real carriage drawn by a beautiful pasteboard horse would surely have amused him less than this play with chairs, in which his imagination bore all the expenses.” (Espinass, *loc. cit.*, p. 388.)

* See Mme. Necker de Saussure, *op. cit.*, Book III, chap. v. Also Anthoine, *A travers nos écoles*, p. 182 *et seq.*

over the supposed misfortunes of a doll, and the child will be grieved or angry if you happen to contradict him or to trouble him in the arrangement of his favourite fictions.

If by æsthetic faculty is meant the power simply of combining images, of creating, to a certain extent, we must grant that the child has it. But if the æsthetic sense is the sense of the beautiful, the taste for and discernment of the beautiful, it is absurd even to state the question. No doubt the child likes the colours, the sounds, which later will be the elements of the beautiful in colour and sound, as appealing to the artist. But all colours please the child, all sounds delight him. The sense of harmony, of time, of order, and of progression is a delicate thing that escapes him. He is indifferent to the beauties of Nature. Pictures do not interest him except when they represent real scenes, familiar objects, to him; dogs, for instance, animals, or perhaps soldiers and battles. Why should this surprise us, when we think of the conditions of development required for the culture of the æsthetic faculties, the refined faculties, so rare even among grown people? How many people remain children in this respect all their lives! When we consider the discordant toilets of peasant women, and note the indifference of the peasant to the beautiful paintings which Nature is constantly renewing before his eyes, is it hard to understand that the child is also incapable of feelings which can be only the result of a long intellectual evolution?

Perez has devoted a whole chapter of his psychology of the first three years of childhood to this subject.* But he is obliged to concede that the musical education does not begin before the age of five or six years; that the word "pretty," which is so continuously on the baby's lips, is a synonym of all that is new, brilliant, pleasing; that in the choice of playthings it is the size, the brightness, the novelty, which determines it; that the child of three years, even, goes crazy over the images of Épinal, while the pictures of a master say nothing to him; in a word, that the child has not and can not have the sense of the beautiful. There is, at most, but one exception to be made concerning singing and music, which very early seems to have a certain attraction. From the age of five months Tiedemann's son accompanied his mother's songs with signs of pleasure by moving his arms and legs. And we might cite many analogous observations.

There are other points to be cleared up in the mysteries of childish imagination. For instance, it is a question whether the child, in his tend-

* Here are some of the interesting facts reported by Perez: A child, three years old, expressed thus his admiration of an Italian picture: "It is very pretty, papa; there is a lot of gold, a lot of red, and a lot of blue; and down there is a papa and a mamma; there is no baby." So another child on seeing a mountain said, "Oh! the pretty mountain!" but he justified his enthusiasm by remarking that it was much larger than his house, perhaps four times larger. Perez has elsewhere devoted a whole book—a little too long, perhaps—to the same subject: *Art and Poetry in the Child*, Paris, 1888.

ency to exaggerate, which, moreover, will always be a characteristic of imagination, is not imposed upon by an error of his senses. The blind man described by Cheselden thought things extraordinarily large when he began to see. Is there not an analogous optical illusion in the eyes of the child? When we return to a place that we have not seen since we were three or four years old everything seems shrunk to us: the houses and the monuments seem to have been lowered. Is it simply the effect of our own stature being increased, while the city has remained the same? It is hard to admit this, and we incline to the belief that things appear larger to the child than they will seem later, because he has not yet travelled over great distances, nor compared many altitudes, just as the hours seem longer to him who has lived but a little while, as Paul Janet has ingeniously shown, and shorter to him who is already far along on the road of life.

Beginning with exact perception and intuition of reality, imagination very soon comes to forge for itself a little world of fancies, so belying its very origin; the more elements of action and the more images it seizes in the contemplation of things, the more disposed is it to create myths. The psychological evolution is full of these contrasts. The faculties, in their natural development, bear fruits and flowers which the character of the trunk and of the roots fails to reveal to us. Not only do the effects differ from their sources, but they are in direct opposition

to the primitive causes that cradled them. A slave to the perception of real objects in its beginnings, imagination comes to be the freest of all the faculties when it has reached its height, removes us furthest from the truth when it breaks loose with its greatest boldness. Is it not by an analogous contradiction that the affectionate sensibility and the love for others results, in a way, from the child's egoism, from the love of self, if at least it is true, as can hardly be questioned, that the more the child loves his own pleasure the more he is led to love those who provide this pleasure for him; the intensity of his feelings of friendship being in proportion to his ardour in seeking selfish satisfaction, and the cold natures, without tenderness, hard hearted, being precisely those which in youth did not passionately desire personal pleasure?

We shall meet with imagination again in the child's plays, in the little practical inventions in which his initiative displays itself. But even now we may conclude that imagination is really active in the child, not only the sensitive and involuntary imagination, but intentional imagination also; and this, because it finds itself in conditions most favourable to its exercise.

The materials at its disposal are not numerous, but they lend themselves marvelously to the work of imagination. "The excessive imagination of the child, as of primitive peoples," says Guyau, "depends in great measure upon the lack of distinctness in perceptions which transform

themselves at will one into the other. We see what we will in what is as confused as the form of the clouds. The child does not distinguish clearly either time, places, or persons. The imagination of children, then, has as a starting point the confusion of images produced by their reciprocal attraction; they mingle what has been with what is or will be; they do not live, as we do, in the real, in the determined, but they dream about everything they perceive."* Let us add that the more limited the acquired experience, the greater is the liberty of imagination. It makes up for the poverty of its resources by the independence allowed its conduct. Later it will shatter itself in its first contact with the exact knowledge of the laws of Nature. The faculties of reflection, the scientific faculties, will lose no time in showing it the impossibility of the fictions in which it may have been tempted to lose itself. Accordingly, instead of increasing, as do most of the other faculties, instead of developing with age, at least in the ordinary man, in all who are neither artists nor poets, imagination, on the contrary, will tend to diminish and to decrease.

* Guyau, *Education et hérédité*, p. 147.

CHAPTER VIII.

CONSCIOUSNESS.—ATTENTION.—ASSOCIATION OF IDEAS.

- I. Consciousness.—The gradual development of consciousness in intensity and extension.—The conscious states and the consciousness of the self.—Conscious states following an unconscious act, a conscious perception, an absolutely internal conscious state.—Consciousness is not coextensive with the whole mental life. II. Attention, a more intense degree of consciousness.—Attention in the child and in the adult.—Attention called spontaneous.—Voluntary or active attention.—Passive attention.—The child's attention is in one sense only a perpetual distraction.—Causes of the child's involuntary attention.—Novelty produces surprise, astonishment, and consequently attention.—Is involuntary attention always caused by affective states?—Curiosity, the intellectual germ of attention.—Origin of voluntary attention.—Voluntary attention also presupposes stimuli, but inner stimuli.—The exercise of attention in the child's plays.—Effects of attention.—The lack of attention in idiots. III. Attention isolates and separates intellectual elements; association of ideas reunites them.—Mechanical characteristics of the association of ideas.—Successive states of consciousness tend to reappear in the same order.—Association of distinct impressions not contiguous in time.—Associations by resemblance.—Purely verbal associations by the sound of words.

I.

MORE than once in the course of the preceding chapters we have had occasion to speak of

the child's consciousness, and to show that the essential fact of the life of the mind, the inexplicable and indefinable character common to all the conscious phenomena, is developed only step by step. The light of consciousness, in succeeding the almost complete obscurity of the first days, passes through all the degrees of clare-obscure, then of a brightness more and more intense. On the other hand, the field over which it sheds its rays is enlarged more and more; confined at first to mere sensations and to first impressions of pleasure and pain, it extends afterward to perceptions, to remembrances, to emotions, to the phenomena of the imagination; and we shall see it now manifesting itself in the acts of attention, of judgment, and of reasoning; annexing to its domain each day a larger number of acts, of distinct states, until the day when, turning in upon itself, so to speak, it will give birth to the idea of the *ego*, and will, properly speaking, establish the personality. Let no one think that the conscious states, which exist very early in the child, can immediately and at the first onset serve as principles of the idea of the *ego*, of the distinction between subject and object. The child is conscious of a multitude of successive acts which exist only at the moment when they are produced, long before he becomes conscious of his personal existence, of a self that lasts and survives the disappearance of such and such a conscious state. He can think, even reason, long before he knows himself. Romanes says very truly that there is a period in the child's life during which judgment

develops so far as to enable the mind to utter a truth, without its being sufficiently developed to be conscious of itself, in so far as the mind is the object of its own thought, and when, consequently, it can not yet assert a truth to itself as a truth.*

In the first two years of life, then, consciousness is simply a succession of conscious states, and we have but to consider its double progress in intention and extension; until, from the grouping of these phenomena, more and more clearly known and more and more numerous, shall finally spring forth the idea of the *ego*, the real consciousness.

Consciousness seems to obey a regular law of evolution in its development in intensity. It is at its lowest stage when it shows itself by lighting up, for the first time, an activity before unconscious; when, for instance, the intelligence plays a part in motions, so frequent in the child, which were at first only automatic impulses, reflex motions, or when a feeling of pleasure or of pain accompanies a phenomenon which is purely physical. It attains a higher degree of clearness when it follows, not an unconscious phenomenon, but a former conscious state; for instance, when the remembrance or the image of a perception already acquired is produced by its repetition. Finally, it rises still higher, or, to state it better, it is more profound when it follows, not a perception, that is to say, not a phenomenon produced

* Romanes, *Mental Evolution in Man*, p. 156.

by an outward impression, but a conscious state, absolutely internal ; for instance, when a remembrance calls forth another remembrance, when one image begets another image. Then the inner activity has really begun. A work of ideation takes place, which, because it is wholly internal, is accompanied by a more active consciousness. And we are now nearing the time when the will, following upon a conscious idea or desire, determining an intentional act, will call forth a still more intense consciousness, a consciousness very different in its character and in its effects, since it will no longer be merely the consciousness of a phenomenon, but will become the consciousness of an active force, of the *ego*, and of the personality.

In its development in extension consciousness very soon embraces the greater part of the acts performed by the child or of the phenomena produced within him. The unconscious life of the sleeping state gives place, little by little, to the awakened life, and during his waking hours the child is almost constantly in a state of consciousness. Sensations, perceptions, remembrances, fancies, this is the train of conscious acts which unroll themselves in a sort of continuous march. But, in spite of the fact that the list of the states of consciousness is extended from day to day, consciousness does not coincide with all the acts of the child's life. The unconscious doubtless draws back, becomes less and less, but it maintains its rights, and will never completely lose them. The conscious life is always framed, as it

were, by a large number of automatic and unconscious motions, of obscure impressions, on which no sensibility sheds its rays. If it is true of the adult, as Ribot says, that in any man the sum of the conscious states is much less than the sum of the nervous actions (reflex actions, from the simplest to the most complex); that the conscious personality can not be a representation of all that goes on in the nervous centres; that it is only an extract, a reduction; it is still more true of the child, in whom there still remain, so to speak, many unconscious provisional states, the circle of conscious acts being still very limited, and the consciousness, finally, not having conquered all the territory which it is afterward called upon to subdue.

Moreover, what is this consciousness in itself which becomes clearer and clearer, more and more extended? Is it simply, as the psychologists of the new school would state it, a something superadded to the reflex and unconscious acts, and, to use a word that has found great favour, an *epiphenomenon*, a supreme effect of the organic development, something like the silvery bright fringe of foam bordering the dark wave of the ocean? Is it, on the contrary, the progressive manifestation of a force *sui generis*, which at first buried, as it were, in the organism, struggles against obstacles, and makes its way to the light little by little, shedding its rays farther and farther; the revelation of an incorporeal substance, which can not produce its full effect until it has found the instruments necessary to

its action in a completely developed nervous system and brain? This is the question as it stands, but we do not have to settle it here in our studies of pure observation, from which problems of substances and of causes are necessarily excluded. Doubtless the observation of the child upholds those who believe, in spite of the protestations of the idealists,* that the way is prepared for the conscious by the unconscious; but it does not prove that the conscious is a consequence of the unconscious. The unconscious does assuredly precede consciousness in the evolution of time, but nothing shows that it creates consciousness. And on this point we shall call upon the valid testimony of a pupil of Darwin, Romanes. He says: "From a philosophical point of view, no one can have more respect for the problem of consciousness than I have, and no one can be more convinced than I of the impossibility of our obtaining a solution of the question. I am completely in accord on this point with the most advanced idealist; and I consider that in the idea of consciousness we possess not only our ultimate knowledge, but the only mode of existence which the human mind is capable of conceiving of as existence, and, consequently, the condition *sine qua non* of the possibility of an external world.

* On this subject see Fouillée's book, *L'Évolutionnisme des idées-forces*, 1890, p. 39, where Fouillée discusses and decides in the affirmative (which seems faulty to us) the question as to whether consciousness is coextensive with the mental life. The unconscious, so called, according to Fouillée, is only a new name for material phenomena, or for matter in itself.

... In trying to trace the progress by which consciousness emerges from the inferior phases of mental organization, I am as far as one could be from the hope of throwing any light on the intrinsic nature of the phenomenon whose probable beginnings I am trying to describe. It is as true to-day as in the days of Solomon, that "just as you do not know how it is that the child's bones grow in the mother's womb, so you do not know what the paths of the mind are." *

II.

One of the great difficulties of psychological analysis is that it is obliged to study successively, thus isolating in distinct divisions, the faculties or mental states which Nature trains and develops simultaneously. In order to unravel the tangled skein of the child's psychic operations it is necessary to go back to them again and again, to approach a complex reality from all sides, and take the measurement of the nascent soul, so to speak, in every direction, which, among other inconveniences, necessitates repetition. Thus we have already encountered attention several times in studying perception, memory, imagination, feelings, and even physical activity. But it is necessary to consider again by itself, in its germs and in its growth, this particular power of concentration, of intellectual direction, which all the psychologists agree in

* Romanes, *Op. cit.*, p. 194.

recognising as one of the essential elements, as the indispensable condition of the development of the forces of the mind.

It may be argued that attention, taken in itself, is but a degree, a mode, a form of consciousness, a more intense consciousness, or, as the English say, an intensification of consciousness. Indeed, all the mental operations, to whatever category they belong, can be reduced to the form "attention." There is not an intense emotion, a connected action, a clearly defined perception, in which attention does not enter more or less.

Attention, thus understood, and considered independently of the causes that produce it, exists in the child as well as in the man. At a very early age, indeed, there are moments of keen consciousness when all the intelligence the child possesses is concentrated on one point, when he is fascinated, for instance, by a light or a bright colour. The external signs of attention show themselves then: the eye is fixed; the child is motionless, plunged in a sort of stupor or of ecstasy. As Ribot says, "The whole body seems to converge toward its object; all motion stops; all the energy at the individual's disposal aims at the same point."*

It is this first form of attention that Ribot calls "spontaneous"; we believe, on the contrary, that this appellation ought to be reserved to designate voluntary attention—that which results from an inner excitation of thought. Noth-

* *Psychologie de l'attention*, p. 8.

ing is less spontaneous than the attention of the child, since it is generally provoked by a strong external impression. When Condillac defined attention as a dominant and exclusive sensation, he was wrong in only one particular—namely, in wishing to extend to the voluntary phenomena what is true of involuntary phenomena, and of the, so to speak, passive attention of the first period.*

It is a question of words, it will be said, and indeed the difficulty results from the fact that in the language of psychology, which is so imperfect, the same term represents states of consciousness which differ greatly if not in their phenomenal appearance at least in their origins and their causes. As for us, and according to the etymology of the word, which indicates both a tendency and an act of the mind, real attention, whatever Ribot says about it, may be defined as the liberty of the mind—that is to say, in the child, in the natural dispersion of his ideas, in the fickle variability of his imagination, in the midst of all the sensations which follow each other and whose plaything he is, we can find but the phantom of attention.

The attention claimed for the child is most

* Condillac, who, without suspecting it, has written in places a psychology of the child instead of adult psychology, defines attention as we have just given it: "That operation by which our consciousness, with reference to certain perceptions, increases so rapidly that they seem the only ones of which we have taken account." (*Essai sur l'origine des connaissances humaines*, part i, sec. ii, chap. i.)

often, indeed, only the shadow, the phantom of voluntary attention. Read the chapter, otherwise so interesting, which Perez has written on this subject,* and you will be convinced that the essential characteristics of active attention are usually lacking in the intellectual states represented as attentive. In Perez's examples attention is constantly confounded with an imperious need, like that of the nursling looking fixedly at his mother's breast; or with a lively sensation, as in the case of the child a month old, who can follow for three or four minutes the reflection of the light on a picture placed near a window; or with the variableness of impressions, as in the case of the little girl, three months old, who is depicted to us as being attentive to all that went on around her—to sounds of every sort, to the noise of a step in the room. In these different cases in which the child showed proofs of attention, the observing subject, Perez admits, seemed to belong less to himself than to the object observed. Is not this choosing what is characteristic of opposed states in order to make of it a feature common to all states of attention? The attentive mind is master of itself; it directs, fixes itself; it changes its place as it will. Far from being a dominant sensation or a successive compliance of thought to the manifold impressions of the senses, attention consists in ruling sensations in order to follow voluntarily one idea

* Perez, *op. cit.* It is a certain abuse of words to class as "attentive" a state which he himself declares to appear as "reflex," and which is only a "passive reaction."

which is preferred to all others. It is not the result and the rebound of an excitation from without; it emanates from an effort within. As to this "habit of prompt attention, scattered capriciously—that is to say, insufficiently accorded to everything"—it is indeed characteristic of the child; but it is a denial of real attention which holds the mind on a single object, while repressing every other kind of sensation, and consigning to inaction all faculties that might throw strange impressions in the way.

One need but teach a child to read, even a child four or five years old, to understand how little this restless being knows of attention, and at the same time to see how many states produced in him simulate attention. Put him in the garden with his primer; there, in the midst of the sensations which, as it were, whirl about him, it will be almost impossible to fix his mind. He will interrupt his spelling incessantly with all sorts of exclamations: "There goes a butterfly!" "See that bird fly!" Place the same child, on the other hand, in a rather dark, rather empty room, where the sense solicitations are few; let him see nothing but his spelling book, and you will find that he will repeat his lesson very docilely. But even then you have not a really attentive mind to deal with, a mind making an effort of itself to follow a given direction; you will have before you only a passive being, whom you keep by dint of skill and much managing under the rule of a single sensation, that of the syllable you are making him spell, and who will escape

you on the first occasion to become the slave of a new sensation. A child listening to an unusual noise or looking at a bright-coloured object may resemble an attentive man externally, because of his immovableness and the fixedness of his glance; but this sort of enthrallment, in which an exclusive impression holds him, has but the outward semblance of attention; according to Bossuet's expression, it is only a "forced attention."

We find here, in new terms, the general law of which we have cited so many examples—namely, that the definite states of human consciousness are preceded and prepared for by very different and sometimes by opposed states. In one sense, we might say, without paradox, that the child's attention is only perpetual distraction. In any case, there is in the first age a series of attentive states rather than a real faculty of attention.

What, then, are the causes that turn the child's involuntary attention from one object to another? The first is the novelty of impressions, for novelty renders impressions more intense. As a general rule, anything that is presented to the child for the first time will captivate him and occupy him for several moments at least. Astonishment, the surprise which every unexpected appearance causes, are attentive states. But we do not have to wait very long for the child to give signs of attention. Thirty days after his birth Tiedemann's son noticed the gestures of those who spoke to him; their words had also as great an

influence, even quieting his cries. At two months and a half the child observed by Taine heard the voice of its grandmother, and turned its head in the direction from which the sound came. To the child, who has everything to learn, every perception is a surprise, and consequently every perception has an effect upon his intelligence. But the more unexpected the impressions, the less they agree with the general run of daily experiences, the more easily will attention be excited. Romanes tells us that when a woollen sock was put on the hand of his daughter nine weeks old, she looked at it very attentively, as though she saw that some strange change had unexpectedly come over her hand.

Darwin said: "When attention is called forth suddenly and forcibly, it is transformed into surprise; this, in turn, becomes astonishment, which leads to stupefaction and to fright."* We might question this genealogy of the states of consciousness and hold, for instance, that surprise is the starting point, that it precedes and determines attention, instead of following it.† But, not to strain a point, it is certainly true that the two states, emotion or the affective states on the one hand, and the intellectual act on the other, are coincident and coexistent. And the proof of this is that the one and the other show them-

* Expression of Emotions.

† Compare Descartes: "Admiration is a sudden surprise of the soul which inclines it to consider attentively objects that seem rare and extraordinary." (*Traité des passions*, part ii, article 70.)

selves by the same expression of the face—a slight elevation of the brows.*

The other stimuli of the child's attention are the different emotions that he is capable of feeling: the agreeable emotions; above all, those that naturally captivate the senses because the desire for pleasure is satisfied; for instance, all that tickles the appetite of hunger or of thirst; later, all that calls forth sympathy and affection. But the disagreeable emotions too are, to a certain extent, the starting point of the attentive motions, although they usually seem to result in turning aside or in repulsing thought, and it seems as though attention and aversion could not exist together. Examine a frightened child, however, and you will convince yourself that even in his fear he tries to account to himself for the object that startles him; he will look at it stealthily out of the corner of his eye. But here the affective state is not the real cause of attention; and if it does not prevent its coming altogether, it is because there is already a stimulus of another order in the child, an intellectual element; I mean curiosity.

Indeed, whatever truth there may be in the rule laid down by Ribot—namely, that, “strong or weak, everywhere and always, *involuntary attention has affective states as its causes*,” we do not believe that this rule is as he states, “absolute,

* Note also among the external signs that betray attention the open mouth (Darwin) and the momentary suspension of respiration (Sikorski).

without exception." Seeing, hearing, touching, simply for the sake of seeing, hearing, touching, are not unknown even to the child. And from these disinterested perceptions result, very naturally, the attentive states of looking, listening, and feeling. It is true that particular pleasures, all of which result from the interest which sensible objects inspire in the child, accompany these motions of attention, and, if we wished to so state it, even stimulate them. But it will be seen, at least, that we have something more than a purely biological origin for attention, which Ribot claims for it, when he tells us that its first forms have been linked to the most imperious conditions of animal life, that it is connected in the final analysis with what is most profound in the individual, the instinct of preservation.* That in the first weeks the child does not interest himself in anything except what touches him in the material needs of nutrition, no one will dispute; but very soon by the side of the animal awakes the human being, with his brain, with the wants belonging to intelligence. Ribot establishes this point himself by citing Preyer: "Toward the end of the third month the child explores the field of vision, gradually allowing his eyes to rest on objects less and less interesting. It is the same with the other senses; the transition is made little by little from that which affects him most to that which affects him least."† But what affects him least is precisely the ensemble of things that have no

* Ribot, *Psychologie de l'attention*, p. 143.

† *Ibid.*, p. 50.

connection with his physical needs, and which the child studies simply in order to get acquainted with them. Ribot, who does not seem to admit in any way the intrinsic attraction of the intellectual work, complacently cites the two following examples, borrowed from Perez*: "One day a child, six years old, who was, as a usual thing, very *distract*, sat down of his own accord at the piano to play an air that his mother liked. The same child, when seven years old, seeing his brother occupied with his studies, went and sat down in his father's study. 'What are you doing?' asked his nurse, who was astonished at seeing him there. 'I am doing a page of German,' said the child. 'It is not very amusing, but I want to give mamma a pleasant surprise.'" And Ribot concludes from these anecdotes that the piano and the German did not awaken attention spontaneously. Then there would be no study attractive in itself, and we should have to admit that the attention of the *savant*, of the philosopher, is "artificial"—that is to say, it has no direct motive power—that it always results from a feeling, such as the fear of punishment, the charm of rewards, ambition, interest, in the practical sense of the word, and so on.

What is this innate curiosity, then, which, Ribot himself declares, is, as it were, the appetite of intelligence, and which is found in some degree in every one? It is hard for us to consider it as an affective state; the pleasure that mingles with

* See *L'enfant de trois à sept ans*, p. 108.

the satisfaction of curiosity is the effect and consequence of it rather than the origin and cause. And, to keep within the bounds of our subject, not to call on the example of the attentive efforts, determined in the man of study by the sheer attraction of science, do we not find traces of pure curiosity in the child? Taine says: "The child of twelve months spends the livelong day in tasting, feeling, turning over, letting fall, smelling—in short, in experimenting with everything that falls in his way; whatever the object may be, a doll, a basket, a rattle, a toy, as soon as it is sufficiently understood, the child lets it alone; the object is no longer new; the child has nothing more to learn, and the object interests him no longer."

Curiosity is the real source of voluntary attention; for the curious child is no longer under the rule of external impressions which are forced upon his sight; he seeks them himself; he keeps them for some time under the notice of his mind, so to speak. But the attention called forth in the child by curiosity is only a shadow of the attention which is its own mistress. Childish curiosity becomes tired very soon, and lasts only as long as the novelty of the object arrests and holds it. To speak exactly, it is spontaneous attention, but it is not yet voluntary attention.

However unconscious may be the first concentrations of thought of which the child gives so many proofs, it is there that real attention begins. It will develop more or less rapidly in proportion to the care that is taken in helping the child to

form a habit of receiving these intense dominant impressions which hold and captivate his mind. When he has fixed his gaze a number of times on the bright outlines, on the bewitching forms that attract him, when he has lent his ear to the strong voice that rules him, to the harmonious sounds that charm him, he will be led gently to direct his thoughts of his own accord toward these habitual objects of his contemplation. To the habitual excitation from without will come to respond, little by little, a voluntary motion from within. There is no other secret for calling the mind to liberty than that of charming and imprisoning it at first in continued and forced sensations.* It is wonderful to see how the inner energy by a natural evolution, by the force of intelligence, makes its way to the light, how the will glides by degrees into the habit of the work imposed upon it and of thought restrained and kept upon a single point. The child's mind is strengthened little by little in this sort of dependence in which a single impression holds it to the exclusion of all others; it loses the habit of dispersion, of variableness; it lends itself more and more, with ever-increasing docility, to the objects of study placed before it. After having allowed itself to be compelled, it comes to acquiesce, and finally to take the initiative, to wish. At first it gives its attention to whatever will take it, and it ends by being its own master and according attention only when it pleases. Even

* "In everything," says M. Ravaisson, "the necessity of nature is the warp on which liberty weaves."

in the attention of the adult there will always remain something of the involuntary and, so to speak, of the fatal; the irresistible attraction of a favourite thought, of a chosen study, of a ruling taste.*

The word "voluntary," applied to reflective attention, must not deceive us. There are, doubtless, pure motions of attentive will; for instance, when against winds and tides, in spite of the agitation of our minds and the excitement of our imagination, from a motive of duty or of pressing obligation, we wish to hold our thoughts on an object from which everything turns us away. Schoolboys, as well as men of science, know these efforts of attentive will, which, not being seconded by the other forces of the soul, often exert themselves to no purpose. It is in this case alone that Ribot's expression seems acceptable when he speaks of artificial attention. A child's bright sally, reported by Maillet, characterizes wonderfully this state of powerless tension. "When I pay attention," said a schoolboy, "I think of nothing."

But fortunately this situation of an isolated will reduced to itself, and consequently producing no result because not accompanied and aided by the ordinary stimuli of attention, is altogether exceptional, we might say hypothetical. Voluntary attention does not emanate from the will alone any more than does voluntary action. Like involuntary attention, it has need of mo-

* See the author's *Cours de pédagogie théorique et pratique*, Paris, Delaplane, part i, section 5.

tive principles. Only while in one case the stimuli of attention are the excitations from without, the action being caused by the very nature of the object observed, by all that it presents of the unexpected, of the interesting, or, on a higher plane, of the beautiful and of the admirable; in the other case the stimuli are within—we find them in ourselves. Will is not an absolute power, an authority scorning help of any sort. To state it exactly, it reigns but does not govern. What does govern is the ideas, the feelings. And it should be well understood that when we speak of voluntary attention, even in the adult, but with greater reason in the child, we mean to say simply that the mind has the power of directing, of concentrating the thought by the aid of the motive ideas or of the excitatory perceptions.

Let us see just what happens in the child. It is in his plays that he makes the first serious exercise of his reflective attention. Let us not expect to find in him that purely mental attention which accompanies a train of reasoning in the adult. The child being incapable of any prolonged intellectual work is attentive only to the actions which presuppose motions, which claim the participation of all the senses, of his eyes, above all, of his hands. Preyer relates that his son raised the lid of a jar sixty-nine times without interruption, and without even getting up. He seemed to be trying to find out how the sound was made. All children have the same tendency to repeat indefinitely the

same action: knocking, opening and shutting; and although we must recognise here in part, the effect of a sort of automatism which calls for the repetition of the same act easily accomplished, it is impossible not to see from the preoccupied air of the child, from his fixed glances, sometimes from the protrusion of his lips, that he is really attentive.

In other words, it is not to exclusively speculative perceptions, to purely intellectual acts, that we must look for the first considerable manifestations of reflective attention; it is to the physical actions which the child performs of his own accord, and in which it is no longer possible to say that he is simply the slave of a ruling sensation. As Sikorski said, "Experience proves that if a child is left on the floor alone with his toys, he remains quiet for a long time, absorbed in his play and showing all the signs of an intense intellectual work." Yes, but this intellectual work is accompanied by physical motions; the child turns his toys over in a hundred ways, and the thought is active only because the muscles are so too. There is a valuable point for educators; they should allow the child some leeway, so to speak, in the first lessons; they should come to terms with the child's need of motion and not demand that the immovability of his body should correspond to the attention of his mind, and that he should be, as it were, a thinking statue. And, finally, they should remember that the child's ideal, as he continually shows in his eyes, is the

alliance of physical activity with intellectual exercise.

Charm, interest, here is the great source of attention. But the charm is not only in things: the child creates it in part. The diversity of his tastes prove this, also his versatility, his caprices. What pleases one displeases another. What delighted a child a few moments ago disgusts him now. It is because interest is subjective rather than objective; and the best criticism one could make of certain methods of attractive instruction is that they pretend to find in the very nature of things, in the facility of methods, in the agreement of means, the talisman to call forth attention, when they should, above all, try to fathom the secret in the very nature of the child, in his individual tastes, in an appropriate and cautious exercise of his inclinations, and, in certain cases, even in what the attractive instruction pretends above all to avoid, in effort.

But, however it be aroused, charm is nevertheless the necessary condition of any lasting attention. And the end is attained if we can succeed in getting the child to say when we submit him to an exercise of any sort—"That amuses me!" This is what an ingenious observer, Binet, found in the experiments which he performed on the perception of numbers and of distances: "I will say again, at the risk of repeating myself too often, that the first condition of these experiments is to fix the child's attention. I prefer to be in his room alone with him, so

that no stranger shall distract him. I seek, above all, to interest him in the experiments, and I guard against his getting tired. Sometimes the little girl I observed said, 'I am beginning to get tired,' or she expressed the same sentiment more mischievously by saying, 'I am afraid I am tiring you'; when that occurred I stopped immediately. But sometimes I had the good fortune to hear the child say, "Again! that amuses me!" I was sure then that attention was awakened, and I tried to profit by the good humour shown."*

It is not necessary to say that when the child begins to study, to learn to read and to write, he will accomplish nothing if he is not capable of attention; but what is more interesting is to show what part attention plays in certain acts of the child's life, notably in walking. "I have been convinced in the case of two little sisters," says the author we have just cited, "that the psychic qualities of the child, especially the stage of his voluntary attention, may have a great influence on the success of the efforts at walking. The older of the two little girls walked alone at twelve months, while the second did not succeed until the age of fifteen months; still, the older was much more delicate, and what is more, she had not the advantage which the second one had of being brought up with another child who could walk and whose example could stimulate and instruct her. I attribute this difference in

* *Revue philosophique*, 1890, vol. ii, p. 76. Article on the Perception des longueurs et des nombres.

development to the fact, often noticed by the parents of the two children, that the elder of the two little girls gave more connected, more methodical attention to her first efforts at locomotion. When she was standing holding on to objects, a table or a chair, she did not let go of one object until she had chosen another a little way off which could offer her a new support; and she went very slowly toward this new object, giving great attention to her legs; these motions were performed with the greatest seriousness and in perfect silence. The younger sister, on the contrary was a noisy, laughing child; as soon as one had placed her on her feet and she had remained motionless for an instant, she was seized by an uncontrollable desire for progression, which seemed to push her forward; it was evident that she had made no calculation as to what object could act as her support, for she advanced without the slightest hesitation to the middle of an empty part of the room; she cried and gesticulated, and was very amusing to see; but she went on tottering like an intoxicated man, and could not go four or five steps without falling—thus her walking was retarded—she could not walk alone with safety until she was fifteen months old.”*

It is not only in learning to walk, but earlier than that, in grasping objects, perhaps even in the action of sucking, that the first effects of attention may be seen; and it is not a paradox to

* Binet, *Mouvements des jeunes enfants*, *Revue phil.*, March, 1890.

say that a child who will be studious later reveals it in the way he takes the bottle, the way he grasps and holds it.

Nothing throws more light on the development of normal attention than the study of what goes on in the obscure, veiled consciousness of idiots and imbeciles. The most recent researches confirm this long-established truth—namely, that the intellectual weakness in idiocy and imbecility is the direct consequence of the powerlessness of attention.* And it is interesting to show that the cause of this incurable infirmity corresponds exactly to the absence of the intellectual or affective principles which, in the intelligent and impressionable child, call forth perception or the action of attention. “In the idiot,” says Dr. Sollier, “the affective state is lacking either altogether or in part. The only need it feels, and even then vaguely, is that of hunger. The sight of food alone can sometimes call him out of his indifference. The sensations of an idiot are very vague. He does not perceive them clearly; he does not know how to compare them. He does not grasp the simplest resemblance any better the hundredth time than the first.”† It is the same with insane people. Luys calls attention to the fact that maniacs, people possessed by hallucinations, have no force, or almost no force of attention. The sensations, so to speak, slip over their minds; or, on the other hand, when they have

* Esquirol attributed the intellectual incapacity of idiots to the lack of attention.

† Dr. Sollier, *op. cit.*, chaps. ii and iv.

fixed ideas they are slaves to them—they are, as it were, possessed by them.

There is nothing like this in the normal child. Intelligence shows itself there whether by the intense concentration of which it is capable at a given moment, or by the facility of its evolutions. And it is this last characteristic, moreover, to which the weakness of childish attention is owing; the attention is of short duration, soon wearied, exhausts a thousand subjects in an hour, and can be kept alive only by variety and incessant changing. The child's soul is like an open house which any one who will may enter. His attention has not yet learned to defend itself, and it gives all impressions the right to enter.*

III.

However imperfect the child's attention may be, and although it does not present itself in general except as a subordination of the mind to the successive impressions which contend for the thought, nevertheless it produces its effects from the point of view of intellectual development. Even if the child's attention is not voluntary, still it brings about results which do not differ sensibly from those of reflective attention. It

* We must recognise the fact, moreover, that it is faults of education which often aid in developing this lack. "The habit of giving children a great number of toys, and so of crowding their rooms, is extremely injurious. An immoderate richness in different impressions creates conditions of distraction. (Sikorski, *Rev. phil.*, vol. xix, p. 547.)

isolates the phenomena perceived; it analyzes their different qualities; it renders possible the work of preliminary dissociation, which separates, which frees the elements contained in complex perceptions, and which is necessary in order that by new associations the beginning thought may do its work. *

But the law of association does not apply only when it is a question of imagining, of reasoning—that is to say, of associating in the combinations that appear for the first time the detached elements of perception. It governs memory also; it tends to make the perceptions which succeeded each other reappear in a certain order. And under this form it is, in a way, the automatic side of the mind, a sort of instinctive attraction which calls the ideas one after another; while attention, even in the rudimentary forms, prepares the way for the reflective activity, for reason. In other words, before the analytical, logical connection which the judgment or even imagination will establish between ideas, there is a mechanical association which contents itself with connecting ideas that have already been connected in experience; and it is this association, naturally very strong at the age when the faculties of reflection are still dormant, that explains either the recalling of ideas remembered, or, indeed, the greater part of the judgment and reasoning of childhood.

Indeed, it is not exaggerating the action of the association of ideas to attribute to it a preponder-

* On *dissociation*, as a necessary condition to association, see Rabier *Psychologie*, p. 215 *et seq.*, also Maillet, *op. cit.*

ant part in the first manifestations of childish intelligence. Before the child can break the chain of sensations which obtrude themselves upon him simultaneously or successively, he obeys readily the natural concatenation of things. It is not he himself as yet that puts order into his little ideas; the order they follow is precisely the order of nature. He wants to be fed as soon as he sees his nurse; he wants to go out as soon as he sees the hat that he wears when out for his walk. In a general way, every state of consciousness that has been experienced calls up immediately, when renewed, by a sort of distinctive affinity, the state of consciousness that preceded or followed it.

Romanes, who has studied animals too much not to be beguiled also into the observation of children, states that it is at the age of seven weeks he finds the first proof of the existence of memory in the association of ideas. That is the age, he says, when children brought up on a bottle recognise the bottle for the first time, an object which children always seem to recognise before all others; and he calls to mind the fact that Locke cited, the act of recognising the nursing bottle as contemporary with that of recognising the rod. Romanes adds that in the case of his own child he found that the faculty of associating ideas grew stronger during the ninth week; as soon as her bib was put on—an action that always preceded that of giving her the bottle—she stopped crying for her bottle.*

* Mental Evolution in Animals.

But the law of the association of ideas is not simply an intellectual habit reproducing unchangingly in a faithful memory the simultaneous or successive impressions that are presented to the mind. It tends to make innovations also in bringing together separate impressions which, however, bear some relation to each other. Perez cites the following: "A little girl, three months and a half old, was put for a moment into the arms of her uncle, who had a beautiful rose in his buttonhole; he was surprised to see the child extend her arms, press his coat with both hands, as when she nursed, and then put her lips against his shirt, while making all the motions of sucking. The nurse declared that several days before, when she was out with the child, she bought a bunch of violets and put them in her dress; there was, then, an olfactory sensation associated with the idea and the motions of nursing." We are not so sure that the odour of the rose or that of the violet was, as Perez believes, the principle of the child's illusion; we would incline to the belief, rather, that the child, feeling herself to be in the arms of her uncle, as she was often in those of her nurse, had the idea that an analogous operation ought to correspond to the analogous situation. But however we interpret it, this little instance shows the power of the law of association, which joins the idea of nursing not only with the reappearance of the nurse, as in ordinary experience, but with a fact simply analogous to it, that of being carried in arms and of being near a human breast.

Others have succeeded in showing that the associations founded on resemblance—that is to say, on an apparently objective principle—are, however, in themselves, as are all the others, only subjective associations which result from the coexistence or from the succession of two states of consciousness.* We have the right, nevertheless, if we judge only from appearances, to consider the association by resemblance and by analogy as a distinct category; and it is to this category that most of the child's associations of ideas belong. The association of ideas, like all forms or laws of the mind, has its own physiognomy in the first years of life. And it is undoubtedly the particular frequency of associations that have no other *raison d'être* than a likeness more or less real which is the peculiar characteristic of the child's intellectual activity.† Any analogy, however vague it may be, almost a nothing, will suffice to turn him from one idea to another. Consequently we are often unable to understand a child's thought. We are tempted to believe that it is mere wandering, an absolute incoherence, when he really has his secret reasons for jumping from one thing to another. I have seen a baby two years old, when looking at a book of natural history, recognise and call by name quite a number of animals; when he came to a very brilliant parrot he invariably called it "mamma." After hearing this several times,

* See Rabier, *op. cit.*, p. 191 *et seq.*

† "In idiots it is manifestly the appreciation of resemblances that predominates." (Dr. Sollier.)

one could not but recognise that in the employment of this strange denomination the child allowed himself to be guided by an altogether external association of ideas between the parrot with his bright feathers and the brighter, more striking costumes, the hats covered with feathers worn by his mother and women in general.

It is a superficial appreciation of the resemblances of objects that determines the generalizations of children, sometimes so strange and so haphazard. Where we see only differences they perceive likenesses; they establish relations that disconcert us.* The thought of the child, like that of the poet, is light and winged; it crosses invisible and fragile bridges, which reflection would break should she bear her weight upon them, but over which the child's imagination gently glides as the spider on the fine thread of his web.

Purely verbal associations, those that result from the resemblance of sounds, are found frequently in the child. It is very natural that the consonance of words should exercise a greater influence on an intelligence that is as yet limited than on the reflective mind of the adult. Not that these associations do not present themselves to the mature man also. How often in our meditations or our reveries are we victims to these external analogies of words! But we repulse them, while the child obeys them. One day, when Marcel was two years and a half old, he was at table; the dessert was brought on, and he was

* See chapter xi: How the child learns to talk.

asked if he would have some cheese (*fromage*). He did not wish any, and asked immediately for *mages, mages*. I suspected that he wanted pictures (*images*), and as soon as they were shown him he became quiet. The child's inexperience in respect to language makes these superficial connections easier to him. Murdering words, as he does continually, distorting them at will, the resemblance of a single syllable is sometimes enough to start his imagination off on a new track. It is association, too, that explains the awkwardness of a child's expression—and the same confusion may be produced at any age—the barbarisms which he scatters so profusely in his vocabulary when he gives one word the termination of another that is more familiar to him.

The other classical principles of the association of ideas, contiguity in space, relation of cause and effect, of means to the end, determine many of the child's judgments or reasonings. Examples of this will be found further on.* There is no need to exaggerate the case, however, and to see the unalloyed effect of an involuntary mechanism, a simple automatic juxtaposition of ideas or states of consciousness in acts in which the force of judgment or of reasoning is already showing itself. The psychologists of to-day show a marked tendency to make all the intellectual phenomena dependent upon the association of ideas. Because a word calls up the idea which it expresses, or, inversely, because the object pre-

* See chap. x.

sented calls forth the corresponding term, is it necessary to call in the law of association? Is it not more exact to say that there is an act of intelligent interpretation of the sign, or, in the inverse case, an act of remembrance? "A child ten months old sees her grandfather every day, and his portrait, small, but a good likeness, has been shown her several times. When she is asked 'Where is grandpa?' she turns toward the portrait and smiles at it." Perez, who borrows this anecdote from Taine, gives it as an example of association.* According to this, everything being associated and connected in the mind, there would not be a single judgment, a single act of reasoning, that could not be explained in the same way. We can not admit Sully's opinion either when he offers as examples of association the judgments by which the child affirms that the sun shines, that the rain wets, that hard bodies wound.† These are but immediate perceptions which associate two ideas, as do all acts of judgment, the idea of the sun and of the bright light, etc., but which associate them spontaneously. Philosophers as well as children can be the dupes of a superficial relation between things and can be led away by imprudent generalizations. Every intellectual act, even the most elementary, even that which consists simply in affirming the existence of an object—and the child can do this even before he can speak by showing that he recognises an object—presupposes the connection of two intellectual elements. And in

* Perez, *op. cit.*, p. 162.† J. Sully, *op. cit.*, p. 169.

the same way, the most profound act of reasoning, as in the case of the calculator with his proofs, the observer with his discoveries, rests on the association of ideas. But this is no reason for forgetting and ignoring the differences that distinguish these phenomena from the association of ideas, pure and simple, nor for confounding the operations in which appears either the natural force of intelligence in a perception immediately comprehended, or the effort of thought in a chain of reasoning, with the phenomena of purely mechanical association, with what may be called, in a word, intellectual automatism.

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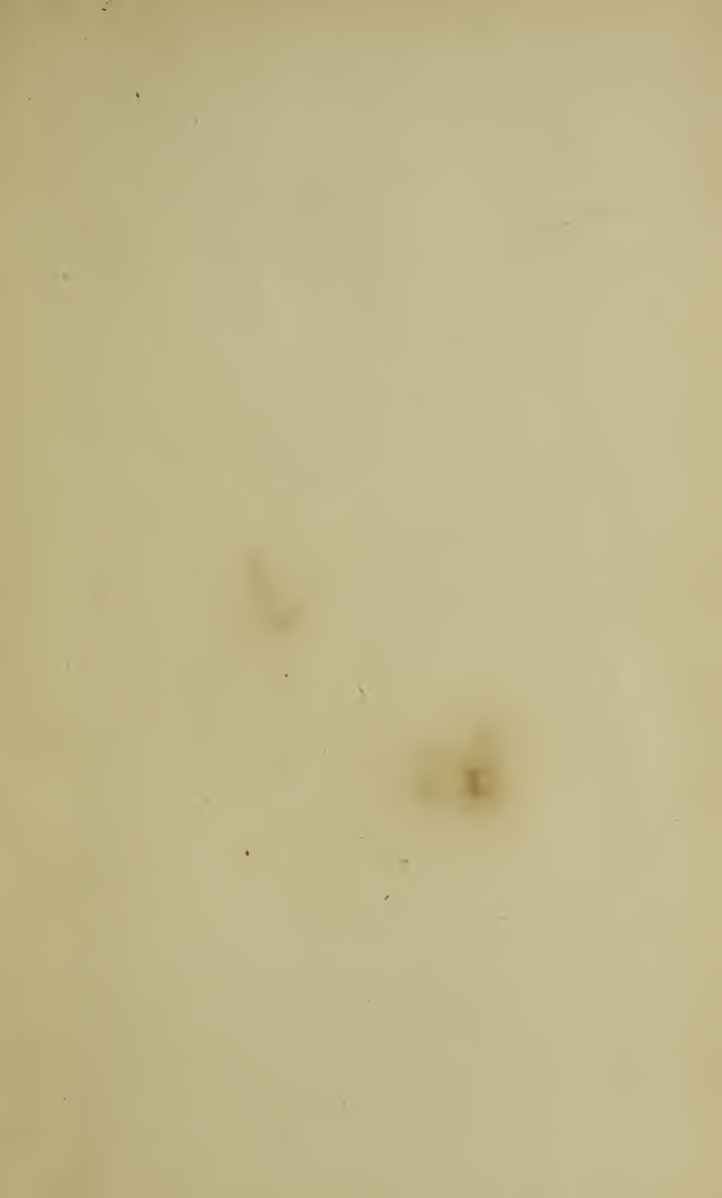
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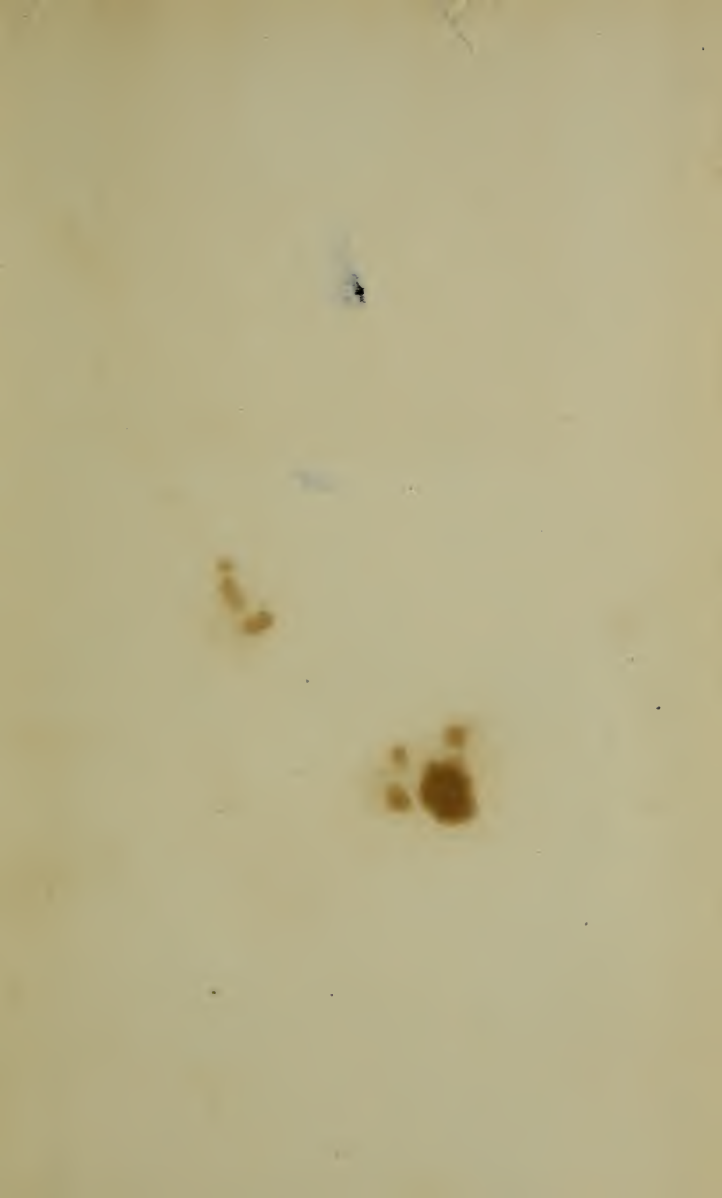
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